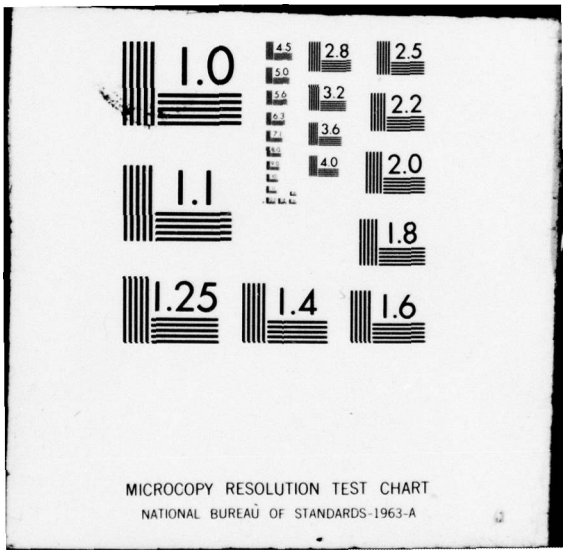
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STANDARD ENGINEERING INSTALLATION PACKAGE. SECURE FACSIMILE (AU--ETC(U)
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STANDARD ENGINEERING INSTALLATION PACKAGE

SECURE FACSIMILE (AUTOVON) 2-WIRE AND 4-WIRE

(11) 30 JUNE 1979

(12) 94 p.

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HEADQUARTERS
U. S. ARMY COMMUNICATIONS COMMAND
FORT HUACHUCA, ARIZONA 85613

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17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

This Secure Facsimile (AUTOVON), 2-wire and 4-wire, consists of Secure Facsimile Models 412-F or 412G, TSEC/KG-34, Modem FXM-40A series, Data Access Arrangement (2-wire), AUTOVON Control Unit-10 (4-wire), Telephone Set, 502 A/B, WECO 270-B Disconnect Device and transmit control box (4-wire).

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This Standard Engineering Installation Package (SEIP) assists project officers, logisticians, engineers, and technicians to program, procure, engineer, and install Secure Facsimile (AUTOVON). Document provides a system description with prerequisites that are essential for effective implementation of Secure Facsimile (AUTOVON). Document also provides necessary drawings and detail wiring instructions for a typical layout. SEIP includes bill of materials and operational test procedure.

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DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY COMMUNICATIONS COMMAND
Fort Huachuca, Arizona 85613

USACC SEIP
NO. 034

30 June 1979

STANDARD ENGINEERING INSTALLATION PACKAGE
SECURE FACSIMILE (AUTOVON), 2-WIRE AND 4-WIRE

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SECTION 1. GENERAL

1.1 PURPOSE AND SCOPE. The purpose of this standard engineering installation package (SEIP) is to provide subordinate command activities pre-engineered guidance for detailed planning, engineering, installing, and testing of communications-electronics (C-E) facilities in accordance with US Army Communications Command (USACC) Supplement 1 to Army Regulation 105-6, C-E Standardized Telecommunications Program. Headquarters, US Army Communications-Electronics Engineering Installation Agency (HQ, USACEEIA) is responsible for the preparation of this document. This SEIP consists of facility add-on of secure facsimile (SECUREFAX) equipment for 2- and 4-wire application, using the automatic voice network (AUTOVON) system to link facilities having a compatible secure system. This SEIP will have worldwide application in USACC telecommunication facilities and may be used by other Department of Defense activities or US Government agencies.

1.2 SYSTEM DESCRIPTION.

1.2 1 Two-wire secure facsimile. A 2-wire SECUREFAX block diagram is shown in figure 1-1. The 2-wire SECUREFAX consists of the Secure Facsimile, Model 412-F or 412-G, TSEC/KG-34, Secure Facsimile Modem, FXM-40A, Data Access Arrangement (DAA), and telephone equipment which consists of Western Electric Company (WECO) 44AW termination block, Telephone Set, 502 A/B, Ericsson Buzzer, WECO 270-B disconnect device, and optional telephone filters.

1.2.2 Four-wire secure facsimile. A 4-wire SECUREFAX block diagram is shown in figure 1-2. This 4-wire system consists of the same type equipment used in the 2-wire system, except for the use of a 4-wire type modem denoted by its last two item numbers (such as 05). The use of this type modem automatically provides a transmit control box as shown in figure 1-2. This modem also is equipped with a universal printed circuit card that is known as the international part of the system. This card completes the capability for the use of this system via a commercial (European) circuit, sheet 5 of STD-MS-0016, that requires the use of a specific network control unit (NCU) for a particular country (such as NCU-13, Germany). NCU code ordering numbers for other parts of the world are not available at this time, but will be published when they become available. Engineers must order the proper NCU ONLY when commercial circuits will be used in Europe. A NCU is not required for use with the AUTOVON. This system must also include an

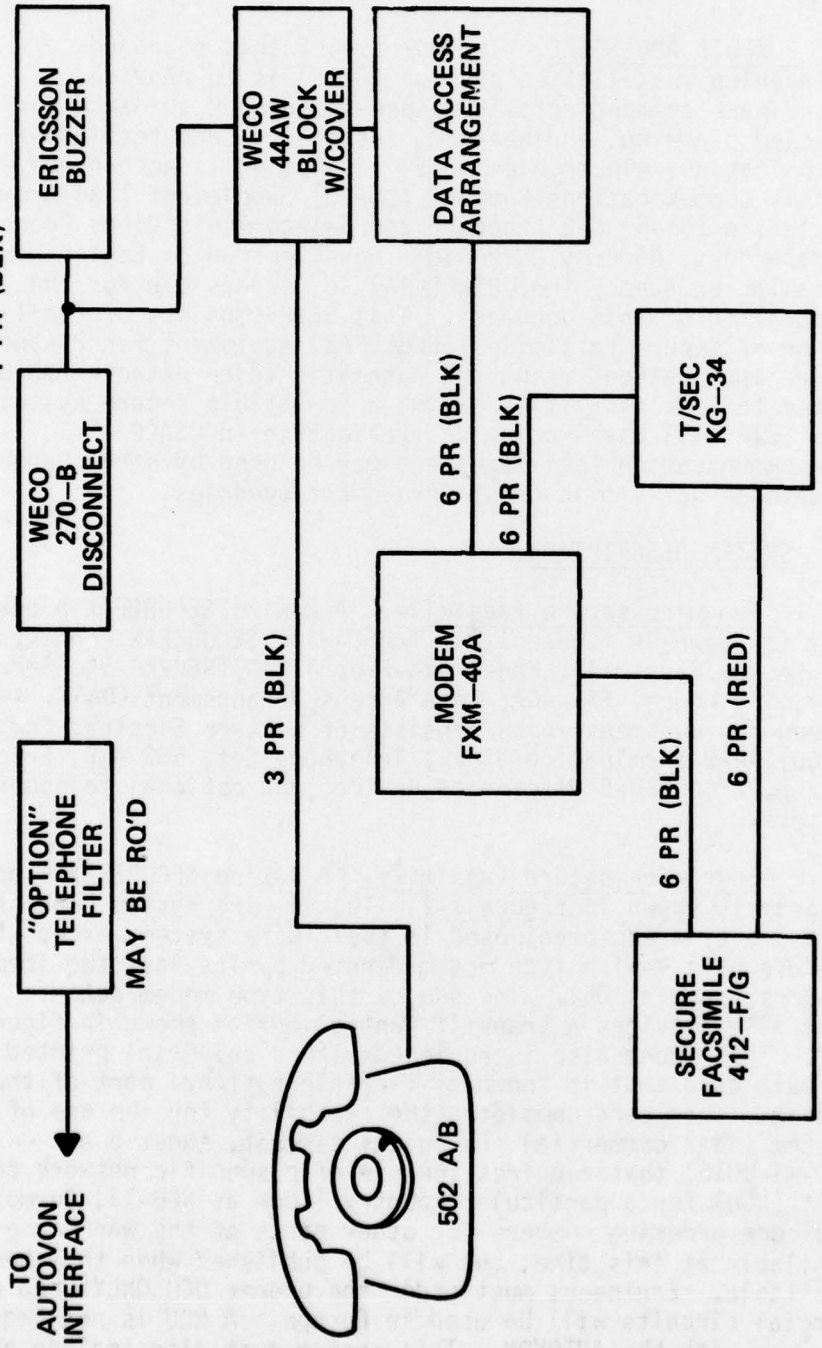


Figure 1-1. Secure Facsimile, 2-Wire Block Diagram.

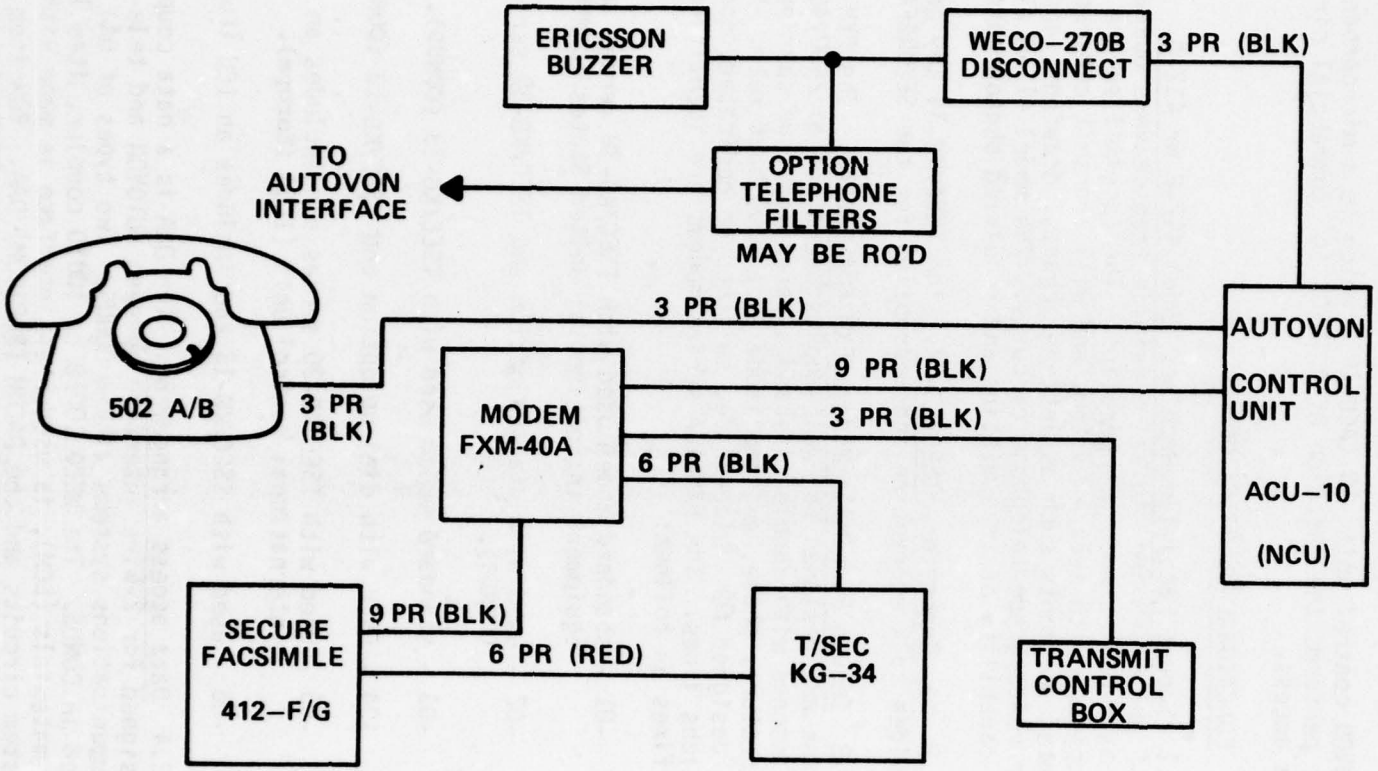


Figure 1-2. Secure Facsimile, 2-Wire Block Diagram.

AUTOVON control unit -10 (ACU-10), which is a microprocessor that performs the function of AUTOVON (or commercial circuit) data access.

1.3 FUNCTIONAL DESCRIPTION.

1.3.1 Secure Facsimile Machine, Model 412-F or 412-G. Models 412-F and 412-G are digital facsimile transceivers operating in the half-duplex mode of operation. The facsimilies are designed to operate with secure systems and will transmit and receive printed documents such as letters, charts, drawings, and maps over voice-grade telephone circuits. The model 412-G also has the capability of transmitting and receiving photographs.

1.3.2 Key Generator, TSEC/KG-34. The TSEC/KG-34 key generator provides bulk encryption and decryption for the SECUREFAX.

1.3.3 Secure Facsimile Modem, FXM-40A series. The FXM-40A series are designed for half-duplex operation at 2400/4800 bauds per second with double sideband suppression, two carriers in quadrature, phase, and amplitude at a 1200 baud rate. Modems are designed for voice-grade, switched or dedicated, communications lines. The FXM-40A series modems are identified with suffixes as follows:

-01 - standard modem used with TSEC/KG-30 series and DAA equipment in Continental United States (CONUS).

-02 - used with dial-up option and TSEC/KG-30 series (CONUS).

-03 - standard modem used with TSEC/KG-13 (CONUS).

-04 - used with dial-up option and TSEC/KG-13 (CONUS).

-05 - used with TSEC/KG-30 series and includes an international control unit (ICU) (Europe).

-06 - used with TSEC/KG-13 and includes an ICU (Europe).

1.3.4 Data access arrangement. The DAA is a data coupler designed for 2-wire interface between AUTOVON and telecommunications systems within CONUS. Two types of DAA units are used in CONUS. The WECO 1001B or 1001D coupler, item 10 on bill of materials (BOM), is used when interface is made with the Bell System circuits and the DACOM (RAPICOM) DAA. BOM item 90 is used when interface is made with other then Bell System circuits.

1.3.5 AUTOVON control unit -10. The ACU-10 is a microprocessor whose function is to interface the AUTOVON or commercial circuit through the modem and related equipment. This unit controls all of the system's features and traffic.

1.3.6 Network control unit. The NCU interfaces the SECUREFAX system with European commercial circuits.

1.3.7 Telephone equipment. The telephone equipment consists of a WECO 502 A/B-type instrument with exclusion key and push-to-talk switch and buzzer. A WECO 44AW block is used for terminating the telephone set and DAA connections. A WECO 270-B-type disconnect switch automatically isolates the telephone set from its line circuit during on-hook conditions and connects the set to the line during off-hook conditions. Line filters may not be required.

1.4 LIST OF APPLICABLE DOCUMENTS.

a. Government documents.

Manuals

T.O. 31-10 Series	Standard Installation Practices

Regulations

CCR 702-1-2	USACC Quality Assurance Program for Engineering, Installation and Acceptance of Communications Electronics Equipment and Systems
CCCR-34-2	Preparation of Engineering Installation Packages and Standard Engineering Installation Packages

Handbooks

(C) MIL-HDBK-232	RED/BLACK Engineering and Installation Guidelines (U)

Directives

(C) DCAC 370-160-3 Site Survey Data Book for Communications Facilities (U)

b. Non-Government documents.

NFPA No. 70 National Electrical Code

1.5 COMMENTS ON PUBLICATION.

a. Users of this publication are invited to submit recommendations for its improvement. Comments should be keyed to the drawing, page, paragraph, and line of the text for which the change is recommended. For convenience, a mailing card is bound with this SEIP. Comments should be sent directly to the Commander, HQ, USACEEIA, ATTN: CCC-CED-SEP, Fort Huachuca, Arizona 85613.

b. Requests for USACEEIA regulations and forms should be addressed to the Commander, HQ, USACEEIA, ATTN: CCC-SPT-RM, Fort Huachuca, Arizona 85613.

SECTION 2. SITE SURVEY DATA AND CHECKLIST

2.1 GENERAL. This section provides information to accomplish preliminary engineering, equipment layout, and arrangements pertinent to add-on installation of the SECUREFAX. Site surveys may not be required, provided adequate site drawings are available at the responsible area.

2.2 SITE SURVEY CRITERIA. The site survey criteria should be conducted in accordance with applicable portions of CCCR 34-2 and DCAC 370-160-3.

2.3 EQUIPMENT CHARACTERISTICS. The physical and electrical characteristics of the applicable equipment are listed in table 2-1. This table should be used as a guide for planning a facility of this type.

Table 2-1. EQUIPMENT CHARACTERISTICS

Equipment	Size (in)	Ambient Operating Range	Heat Dissipation (BTU)	Power Input	Access Clearance (in)	Weight (lbs)
SECUREFAX 412-F or 412-G	40H 45D 26W	41 to 95° F Rel. Humidity 20 to 80%	IDLE: 400W, 22.8 BTU/min XMT: 1100W 12 to 15A 62.6 BTU/min RCV: 600W, 3 to 5A, 31.1 BTU/min	115 Vac 60 Hz, 10A (230 Vac, 50 Hz optional)	36 Front 36 Rear 18 Left 18 Right	375
FAXMODEM FXM-40A Series	5.25H 19.50D 19.00	60 to 90° F Rel. Humidity 20 to 80%		115/230 Vac, +10%, 50/60 Hz 2/1A SP	20 Front 36 Rear	30
TSEC/KG-34	7H 22D 17W	30 to 120° F Rel. Humidity 0 to 90%	90/HR	115 +15% 50/60 Hz, 48W, 120 Vac, 60 Hz .07A	27 Front 36 Rear	45
DAA	7.50H 1.75D 7.50W	0 to 112° F Rel. Humidity 0 to 95%		115 Vac +10% 50/60 Hz, 20A (230 Vac, 50 Hz Optional)		1.75
ACU-10	9.00H 2-1/8D 7.00W			SUPPLIED BY MODEM		
NCU	14.00H 2.50D 6.75W			SUPPLIED BY MODEM		

SECTION 3. INSTALLATION SPECIFICATIONS AND INSTRUCTIONS

3.1 GENERAL. The instructions outlined in this section provide standard engineering and installation guidance for the add-on installation of SECUREFAX AUTOVON equipment.

3.2 INSTALLATION GENERAL INSTRUCTIONS. The equipment will be installed in accordance with established criteria, the inclosed engineering drawings and instructions, and referenced drawings and publications by the engineering activity responsible for a project. Installer personnel must be familiar with MIL-HDBK-232 (C) and T.O. 31-10 Series to ensure the facility conforms to, and is installed in accordance with, standard installation procedures.

3.3 DETAIL INSTRUCTIONS. Instructions are in reference to drawings STD-MS-0016. To preclude repetition of drawing number, only the sheet number will be called out when applicable.

3.3.1 All conduit, fittings, and duct used on this installation shall be made of ferrous material.

3.3.2 All signal cables used to interconnect equipments will be individually shielded pairs. Precautions should be taken during installation to ensure the plastic sheath is not damaged or broken. Only one end of the cable shields will be grounded.

3.3.3 All alternating current (ac) power wiring from the power panels to the equipment will be in conduit or duct and conform to practices specified by the National Electrical Code (NEC).

3.3.4 Grounding of all equipments and cabinets must be completed to ensure the safety of all personnel. This will be accomplished through the conduit by metal-to-metal contact and by the third (green) ac wire which goes to ground on the ac outlet and connects to metal at the ac power panel.

3.3.5 Drawings STD-MS-0016 are based on the use of conduit and duct layout. The project engineer will determine the appropriate materials to be used at each particular site.

3.3.6 Sheet 1 is a complete BOM necessary for 2- and 4-wire SECUREFAX AUTOVON installation.

3.3.7 Sheets 2 and 3 are typical site layouts showing conduit and duct networks.

3.3.8 Local commands are responsible for identifying the requirement for the installation of the WECO-270B, Ericsson Buzzer/Ringer, telephone set, line filter, and a line to the telephone exchange.

3.3.9 Tables 3-1 and 3-2 provide cable running lists and cross connections.

3.3.10 Sheet 4 is the wiring diagram for the 2-wire SECUREFAX AUTOVON.

3.3.11 Sheet 5 is the wiring diagram for the 4-wire SECUREFAX AUTOVON.

3.3.12 Sheet 6 shows two installation detail options for models 412-F and 412-G SECUREFAX. Conduit runs may be made in attics. Cable entrances to the equipment will be made at the top or bottom of the power, BLACK and RED boxes only.

3.3.13 DAA, modem, and cabinet installation detail is shown on sheet 7. The DAA contains a mercury relay and must be mounted in a vertical position (on top of the modem). The modem is mounted 24 inches from the top of the cabinet and centered.

3.3.14 The modem TSEC/KG-34, DAA, and the facsimile must have a separate 20-ampere ac circuit breaker. Circuit breaker assignments must be coordinated with site personnel at the time of installation.

3.3.15 The TSEC/KG-34 will be mounted in an existing relay rack.

3.3.16 All conduit and duct runs should be installed in the paths of existing runs when possible. Any deviation should be coordinated with site personnel. Parallel runs will comply with TEMPEST criteria.

3.3.17 Sheet 8 shows both conduit and duct network for the TSEC/KG-34 installation. Use only authorized knockout holes for connections to the equipment.

3.3.18 Use BOM item 80 for covers to items 17, 27, and 33. Use item 81 for covers to items 30 and 32.

3.3.19 Consult T.O. 31-10 Series when using items 48 through 55.

Table 3-1. CABLE RUNNING LIST FOR 2-Wire

RUN DESIG	CA NO	COND CA	LEAD DESIG	FROM	TO	CKT REF
BLK	1	6PR		FAXMODEM	TSEC/KG-34	XD, SC, RD, RC, RTN
BLK	2	6PR		FAXMODEM	FAX 412-F/G (MODEM ISOL-BOX)	MUX, (ETC)
BLK	3	6PR		FAXMODEM	DATA ACCESS ASSIGNMENT	RI, OH, CT, (ETC)
BLK	4	3PR		DATA ACCESS ASSIGNMENT	44A TERMINAL BLOCK	T, R, A, A1
RED	5	6PR		TSEC/KG-34	FAX 412-F/G (KG/CCU INTERBOX)	XD, XC, RD, RC, RTN
BLK	6	3PR		44A TERMINAL BLOCK	TELEPHONE 502A/B	TELEPHONE HOOK-UP
BLK	7	1PR		WECO 207B	44A TERMINAL BLOCK	TELEPHONE DISCONNECT
AC	8	3C12		FAXMODEM	UPP	+, -, GND
						+, -, GND
AC	9	3C12		TSEC/KG-34	RTPP	+, -, GND
AC	10	3C12		FAX 412-F/G, PWR BOX	RTPP	+, -, GND
GND	11	1C10		RED GND BOX AC PROTECT	TSEC/KG-34 (TB-3 EVEN TERMS)	GND
GND	12	1C10		BLK GND BOX AC PROTECT	FAXMODEM (TB TERM 10)	GND

Table 3-2. CABLE RUNNING LIST FOR 4-WIRE

RUN DESIG	CA NO	COND CA	LEAD DESIG	FROM	TO	CKT REF
BLK	1	6PR		FAXMODEM FXM-40A-05	TSEC/KG-34	XD, XC, RD, RC, RTN
BLK	2	9PR		FAXMODEM FXM-40A-05	FAX 412/F/G (MODEM ISOL BOX)	MUX, (ETC)
BLK	3	9PR		DATA ACCESS ASSIGN-MENT	FAX MODEM FXM-40A-05	R1, OH, CT, (ETC)
RED	4	6PR		TSEC/KG-34	FAX 412-F/G (KG/CCU INTER BOX)	XD. XC. RD. RC. RTN
BLK	5	3PR		FAXMODEM FXM-40A-05	TRANSMIT CONTROL BOX	CONTROL
BLK	6	3PR		DATA ACCESS ASSIGN-MENT	TELEPHONE 502A/B	TELEPHONE HOOK-UP
BLK	7	3PR		DATA ACCESS ASSIGN-MENT	4-WIRE AUTOVON VIA 207B	TELEPHONE DISCONNECT
AC	8	3C12		FAXMODEM FXM-40A-05	UPP	+, -, GND
AC	9	3C12		TSEC/KG-34	RTPP	+, -, GND
AC	10	3C12		FAX 412-F/G, PWR BOX	RTPP	+, -, GND
GND	11	1C10		RED GND BOX AC PROTECT	TSEC/KG-34 (TB-3 EVEN TERMINALS)	GND
GND	12	1C10		BLK GND BOX AC PROTECT	FAXMODEM (TB-8, TERM 10)	GND

3.3.20 Use items 87 and 88 on conduit and duct network for easy identification of RED.

3.3.21 Items 83, 84, 85, 86, and 91 can be used at the discretion of the project engineer.

3.3.22 Item 47 provides for wood screws and toggle bolts for mounting wood panels and hangers. Both items may not be needed.

3.3.23 Item 10 is used to interface Bell Systems communications lines and item 90 is used to interface other than Bell System communications lines.

SECTION 4. ENGINEERING INSTALLATION DRAWINGS

4.1 GENERAL. This section contains only the engineering installation drawings for the add-on of the SECUREFAX AUTOVON. The manufacturer's drawings should be used by engineering activities preparing engineering installation packages (EIPs) for specific sites.

4.2 MODIFICATION OF INSTALLATION DRAWINGS. The engineering drawings may be modified during and after installation of a project to reflect adaptation to local physical and environmental conditions. Copies of modified drawings should be retained onsite and changes, corrections, and deletions forwarded to the responsible area's communications electronics engineering installation agency.

4.2.1 USACEEIA drawings. The engineering installation drawings show the equipment required to accomplish the add-on installation of the SECUREFAX AUTOVON. The drawings furnished with this SEIP are 10-1/2 by 16 inches, foldout type, and are not to scale format. The scale referenced on these drawings refer to "D" size drawings only. Description and application of each numbered drawing STD-MS-0016 is:

Sheet 1 - Bill of Materials.

Sheet 2 - Equipment Layout.

Sheet 3 - Plugmold and Conduit Layout.

Sheet 4 - 2-Wire Wiring Diagram.

Sheet 5 - 4-Wire Wiring Diagram.

Sheet 6 - 412 Facsimile Installation Details.

Sheet 7 - DAA and Modem/Cabinet Mounting.

Sheet 8 - TSEC/KG-34 Installation Details Wiremold or Conduit.

91	09462R	PAINT, SPRAY, GLOSS, GRAY	8010-00-079-3755	CN	1
90	17876A	AUTOVON DATA ACCESS ARRANGEMENT	NSNR	EA	AR
89	22585B	NATIONAL NETWORK CONTROL OPTION CARD F/U/W FXM-40A-05 MODEM	NSNR	EA	1
88	02222Z	TAPE, INSU, ELEC, ADH, PLASTIC 1" x 108" BLK	5970-00-926-7220	RO	AR
87	05147J	TAPE PRESS SEN ADH, PLASTIC. RED 1" W x 36 YDS. SCOTCH-471	7510-00-636-0871	RO	AR
86	00015D	SOLDER, TIN ALLOY, WIRE, ROSIN-CORE, 60/40 TIN-LEAD, 1 LB SPOOL QQ5571	3439-00-273-2536	LB	AR
85	08735A	TY-RAP, 1/16 to 4" WIRE BUNDLE BLOCK 14-190" LG, 0.184" W, T&B TY-28MX	5975-00-899-4606	HD	AR
84	08798K	TUBING, SHRINKABLE, ALPHA, FIT 221-1/8", STD PG C/O 6" LG TO TOTAL 14' CLEAR	5970-00-990-9912	FT	AR
83	10610F	TUBING, SHRINKING KIT, 3/64-1/4, 6 SIZES 10 EA, 6" PIECES, ALPHA	NSNR	EA	AR
82	13333A	TERMINAL LUG, SOLDERLESS, FORK TONGUE, 22-18 AWG INSUL STUD, SIZE 5	NSNR	PG	AR
81	05092K	COVER, ELEC CONDUIT OUTLET BLANK TYPE FORM 8 SERIES, 1½" SIZE, C-H 580F	5975-00-906-3985	EA	AR
80	02836W	COVER, ELEC CONDUIT OUTLET BLANK TYPE FORM 9 SERIES, CAST FERALOY, 1" SIZE, C-H 370F	5975-00-158-8487	EA	AR
79	14549G	CABLE, SP, ELEC, 9 PR 22 AWG, STRAN INDIV SHLD PR, BELDEN 8774	NSNR	FT	AR
78	05285Y	WIRE, ELEC, TW SOLID 10 AWG GR 600V THERMOPLASTIC INSUL	6145-00-191-2569	FT	AR
77	10954W	CABLE, SP, ELEC, STRAN, 1 PR 22 AWG POLYETHYLENE, BLK WH BELDEN 8761	6145-00-866-2303	FT	AR
76	06804F	SCREW, WOOD RHS 8 x 3/4" LG	5305-00-533-5446	EA	AR
75	05708Z	ANCHOR PLASTIC F/U/W NO. 8 x 3/4" WOOD SCREW	5340-00-089-2828	EA	AR
74	22326G	BLANK END FITTING F/CLOSING OPENED END OF G-3000 PLUGMOLD	5975-01-008-7219	EA	AR
73	18836K	ENTRANCE END FITTING F/G-3000 PLUGMOLD	NSNR	EA	AR
72	14280R	RACEWAY, WIREMOLD, G-3000C, COVER	NSNR	LG	AR
71	09376P	RACEWAY, WIREMOLD, G-3000B, BASE	5975-00-610-5875	LG	AR
70	07503A	TERMINAL LUG, NO. 10-12 AWG MS-25036-156	5940-00-142-4775	EA	AR
69	02809E	BOX CONNECTOR, ELEC, 3/4" FLEX CONDUIT CHASE TYPE, T&B 5363	5975-00-844-8413	EA	AR
68	16956E	ELBOW, SHORT, 3/4", T&B 4241	NSNR	EA	AR
67	21628C	BOX, JUNCTION, 6"L x 4"W x 3"D, CAST IRON w/6 SCREWS IN COVER	NSNR	EA	AR
66	07472Q	SCREW MACH 10-32 x 3/4" PHS	5305-00-993-1848	HD	AR
65	13138D	COUPLIN, ELEC, CONDUIT, 3/4" THINWALL COMP TYPE, T&B 5220, STEEL CITY TK-112	5975-00-296-2105	EA	AR
64	18995K	PLUG, 2-POLE, 3 WIRE, CEVITON WIRE DEVICE, PN5384	NSNR	EA	AR
63	03480P	CABLE, PWR, 3C 12 AWG, STRAN, 600V RUB INS AND JACKET	6145-00-170-3649	FT	AR
62	10906F	CABLE, SP, ELEC 3P 22 AWG, STRAN INDIV SHLD PR, w/DRAIN WIRE BELDEN 8777	6145-00-949-3331	FT	AR
61	10349W	SCREW, MACH, 8-32 x 1¼" FCS	5305-00-723-9423	HD	AR
60	11285J	OUTLET, ELEC CONDUIT, TYPE LL, 1½" THINWALL C-H LL 57	5975-00-610-5825	EA	AR
59	07228A	OUTLET, ELEC CONDUIT, TYPE LB, 3/4" THICKWALL, FORM 8, C-H LB 28	5975-00-937-4585	EA	AR
58	02620B	LOCKNUT, ELEC CONDUIT, 3/4" SIZE GALV OR CAD IRON OR ST, NOTCHED TYPE PG/50	5975-00-642-7261	PG	AR
57	17596M	COVER, CONDUIT, OUTLET, 3/4", FORM 8, C-H	5975-00-937-4507	EA	AR
56	06619H	NIPPLE, CHASE, 3/4" SIZE, T&B - 1943	5975-00-834-6780	EA	AR
55	11096L	BOLT, LAG, 3/8" x 3½"	5306-00-406-9225	BX	AR
54	00698E	SHIELD, EXP, F/ 3/8"-16, THD RD	5340-00-567-5686	EA	AR
53	00516Z	WASHER, FLAT, RD, ST, ½" I.D. x 1" O.D.	5310-00-198-3642	EA	AR
52	00586C	WASHER, LOCK, SPLIT, ST, .375" I.D. x .688" O.D. CAD PL	5310-00-637-9541	HD	AR
51	00473Z	NUT PLAIN, HEX, ST, 3/8"-16 CAD PL, 100/PK	5310-00-012-0377	PK	AR
50	11471K	WASHER, FLAT, RD, 3/8" I.D. x 2" O.D.	5310-00-187-2349	EA	AR
49	00446F	BOLT MACH, 3/8"-16 x 3" LG, SQ HD, w/SQ NUT	5306-00-633-0719	EA	AR
48	03117D	ROD, CONTINUOUS THREADED, 3/8"-16 x 6' ST	5306-00-939-9598	EA	AR
47	22144A AND/OR 15135J	SCREW, WOOD 3" x 10 FH CR DRIVE STEEL, MS-35492-86 BOLT TOGGLE, 10-24 x 5" LG SP WING RHS	5305-00-901-3142 5306-00-298-4750	EA EA	AR AR
46	00789H	LUMBER, 2" x 6" x 6' + LONGER, SOFTWOOD DIMENSION	5510-00-220-6244	BF	AR
45	03508Z	WIRE, ELEC, TW SOLID 12 AWG, WH, 600V THERMOPLASTIC INSUL	6145-00-184-5347	FT	AR
44	03534C	WIRE, ELEC, TW SOLID, 12 AWG, GR, 600V THERMOPLASTIC INSUL	6145-00-191-2570	FT	AR
43	03539H	WIRE, ELEC, TW SOLID, 12 AWG, BLK, 600V THERMOPLASTIC INSUL	6145-00-191-2576	FT	AR
42	10955Z	CABLE, SP, 6 PR 22 AWG STRAN, INDIV SHIELDED w/DRAIN WIRE, BELDEN 8778	6145-00-043-0821	FT	AR
41	02376Z	CONDUIT, METAL RIGID, ZINC COATED, THINWALL, 3/4" SIZE, 10' LG	5975-00-178-1217	LG	AR
40	09051L	BOX CONNECTOR, ELEC, 3/4" THINWALL CONDUIT COMPRESSION TYPE, ST, T&B 5223	5975-00-802-6531	EA	AR
39	02841C	COVER, ELEC CONDUIT OUTLET, BLANK TYPE FS + FD, SERIES, CAST FERALOY, C-H DS-100G	5975-00-265-0560	EA	AR
38	18993H	OUTLET, CONDULET BOX, w/MOUNTING LUGS, SINGLE GANG, C-H, FSC-2019	NSNR	EA	AR
37	02381Y	CONDUIT, METAL FLEX, 3/4" SIZE, 50' LG	5975-00-178-1223	FT	AR
36	18994L	CONNECTOR, FLEX CONDUIT, BOX, 90°, 3/4", T&B 5363	NSNR	EA	AR

ZONE	REV	REVISION DESCRIPTION	DATE	APPROVED

GENERAL NOTES:

1. THESE DRAWINGS SUPERSEDE STD-MS-0004, SH 1 OF 1, DATED 8 MAY 78, USACEEIA-CONUS DRAWINGS COM-TL-905, COM-TL-917, COM-TL-897, & COM-TL-908, AND COM-TL-918.

ITEM	AEL	DESCRIPTION	NSN	UI	QTY
35	02387Z	BOX CONNECTOR, ELEC. 1" THINWALL CONDUIT, COMPRESSION TYPE, ST, APPLETON 961100	5975-00-179-0099	EA	AR
34	05090M	BOX CONNECTOR, ELEC, 1½" THINWALL, COMPRESSION TYPE, T&B 5523, STEEL CITY, TC-715	5975-00-065-3904	EA	AR
33	02964E	OUTLET, ELEC CONDUIT, TYPE LB, 1", THICKWALL, C-H LB 38, FORM 8	5975-00-819-5730	EA	AR
32	02965F	OUTLET, ELEC CONDUIT, TYPE LB 1½" THICKWALL, FORM 8, C-H LB 58	5975-00-853-3994	EA	AR
31	02645E	COUPLING, ELEC CONDUIT, 1½" THINWALL COMPRESSION TYPE	5975-00-661-1003	EA	AR
30	02995C	OUTLET, ELEC CONDUIT, TYPE T, 1½", THICKWALL, FORM 8, C-H T58	5975-00-853-3993	EA	AR
29	03108F	REDUCER 1½" TO 1", C-H RE 553	NSNR	EA	AR
28	02379C	CONDUIT, METAL RIGID, ZINC COATED. THINWALL, 1½" SIZE, 10' LG	5975-00-178-1220	LG	AR
27	02984C	OUTLET, ELEC CONDUIT, TYPE LR, 1" THICKWALL, FORM 8, C-H LR 38	5975-00-953-8734	EA	AR
26	701328	HANGER, CONDUIT, F/1½" EMT, GRAYBAR CAT 105 PG 251 NO. 3	NSNR	EA	AR
25	18992N	HANGER, PIPE F/U/W 1" EMT	NSNR	EA	AR
24	09687W	SCREW, WOOD, RHS 14 x 3½" LG	5305-00-180-1544	HD	1
23	07160K	SCREW, WOOD, RHS, 10 x 1½" LG CD	5305-00-901-0766	EA	AR
22	00787F	LUMBER, 2" x 4" x 10'	5510-00-134-3963	BF	AR
21	09160M	PLYWOOD, EXT, 4 x 8 x ¼", FIRE-RETARDANT TREATED, B-C	5530-00-128-3913	SH	AR
20	05165N	COUPLIN, ELEC CONDUIT, 1" THINWALL, COMPRESSION TYPE	5975-00-179-0095	EA	AR
19	02377A	CONDUIT, METAL RIGID, ZINC COATED, THINWALL, 1" SIZE, 10' LG	5975-00-178-1218	LG	AR
18	10167C	FILTER, DISCHARGE UNIT, FILTRON (51932) FDU-103	NSNR	EA	AR
17	02990K	OUTLET, ELEC CNDUIT, TYPE T, 1" THICKWALL FORM 8, C-H T38	5975-00-968-3287	EA	4
16	07708H	BOX CONNECTOR, ELEC, ½" THINWALL CONDUIT STEEL, COMPRESSION TYPE T&B 5123	5975-00-081-9401	EA	AR
15	02375J	CONDUIT, METAL, RIGID, ZINC COATED, THINWALL ½" SIZE, 10' LG	5975-00-178-1216	LG	AR
14	11619D	BLOCK, CONNECTING, WECO 44 AW, COMCODE 101-850-311 (USED w/2-WIRE AUTOVON ONLY)	NSNR	EA	AR
13	02932F	JUNCTION BOX, HOFFMAN 6 x 6 x 4"	5975-00-280-7537	EA	AR
12	02600D	RACK, ELEC EQPT. RR-197	5975-00-686-0206	EA	AR
11	02660K	CABINET, ELEC EQPT, CY-3397 A/G, 85 3/16" H x 22¾" W x 26 5/8" D, 77" SPACE AVAIL F/19" RACK MT EQPT, GEN PUR	5975-00-892-9856	EA	1
10	18847D	(DATA ACCESS ARRANGEMENT) WECO 1001B OR 1001D	NSNR	EA	1
9	15304C	MODEM, DATA, 2400/4800 BAUD, ADAPTIVELY EQUALIZED AND HALF-DUPLEX, DACOM MDL FXM-40A-01, F/U/W KG-34 SERIES	NSNR	EA	1
8	19908W	FAXMODEM w/INTERNATIONAL CONTROL UNIT (ICU) HALF-DUPLEX, F/U/W KG-30 SERIES EQPT. INCLUDES TRANSMIT CONTROL BOX, FXM-40A-05	NSNR	EA	1
7	11855H	TSEC/KG-34	5810-00-463-3270	EA	1
6	14694K	FILTER, SIGNAL, RFI, MDL 258-8526 HOPKINS ENGR CO.	NSNR	EA	AR
5	18585N	TELEPHONE, SINGLE LINE w/EXCLUSION KEY, CONFIDENCER KS/6664 AND G-10 PTT HANDSET, MODEL 502 A/8	NSNR	EA	1
4	03866E	BUZZER, RINGER DEVICE ERICSSON MODEL KLG 5103-2 or EQUAL	6350-00-893-9106	EA	1
3	11287A	AUTOMATIC TELEPHONE DISCONNECT DEVICE/INTERCOM, 2-W, SIG LINE, AN/GTC-30, w/PLUG-IN MODULE	NSNR	EA	1
2	21629D	FACSIMILE TRANSCEIVER (DACOM) 412G	NSNR	EA	1
1	17874J	FACSIMILE TRANSCEIVER (DACOM) 412F	NSNR	EA	1

LIST OF MATERIALS

1	2	3	4	5	6	7	8	9	10

SHEET NUMBER

REVISION STATUS OF SHEETS

DWG INDEX NO:

IDENT NO: STD-MS-0016, SHEET 1 OF 8

ORGANIZATION: US ARMY COMMUNICATIONS-ELECTRONICS ENGINEERING INSTALLATION AGENCY

DESIGNED BY: C.CORNE — DATE: 17 JUL 78

DRAWN BY: T.W.JOHNSTON — DATE: 17 JUL 78

CHECKED BY: [signature] — DATE: 17 JUL 78

APPROVED BY: [signature] — DATE: 27 JUL 78

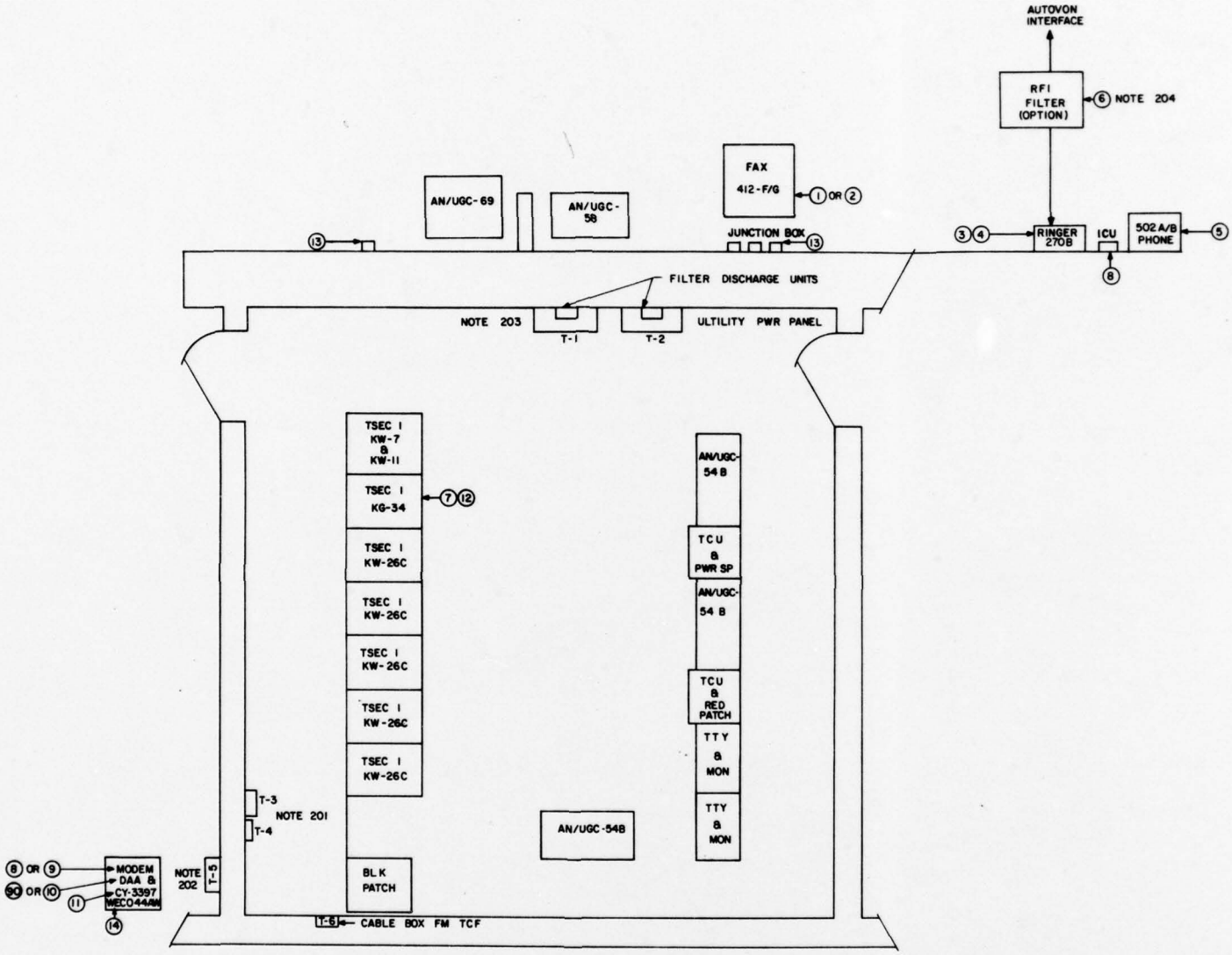
DESIGN ACTIVITY: CCC-CED-SEP

SECURE VOICE (AUTOVON) 2W & 4W INSTALLATION DETAILS

SIZE: D — FSCM NO: 50470 — DRAWING NO:

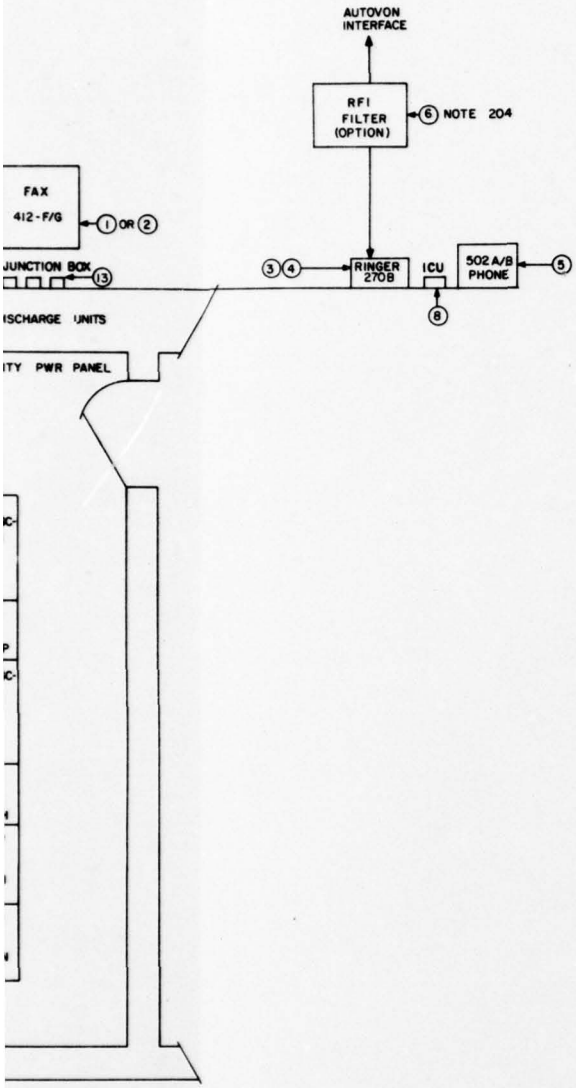
SCALE: NONE — SHEET: OF

EXTENDED TO USACEEIA 1000



EQUIPMENT LAYOUT

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED

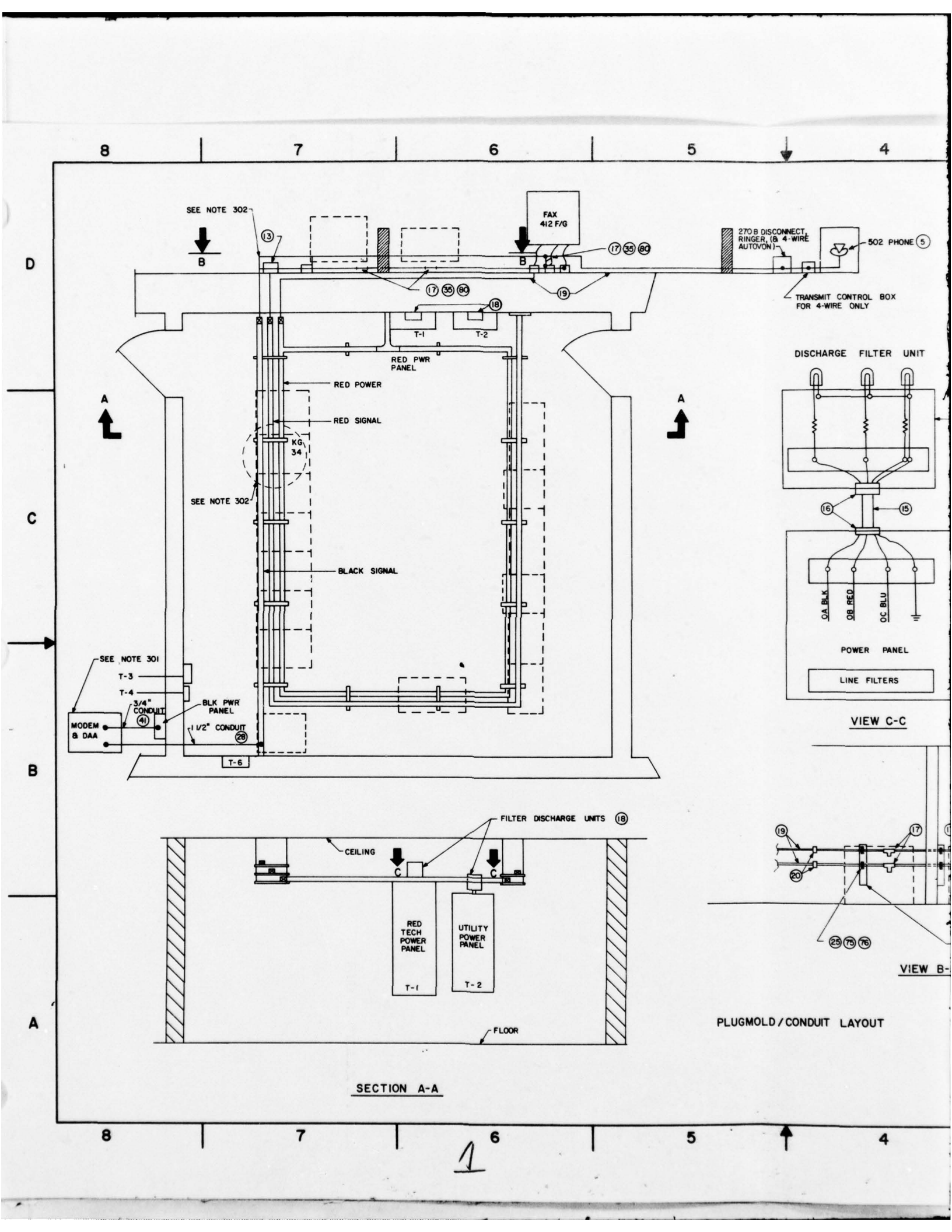


NOTES :

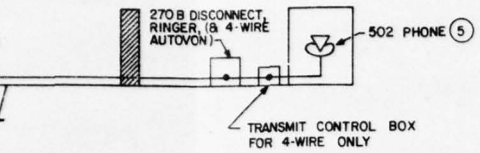
201. T-3 IS A 125 AMP CKT. BKR. AND T-4 IS A 50 AMP CKT BKR.
202. BLK. PWR. PANEL NEEDS ONE 20 AMP CKT. BKR.
203. RED PWR. PANEL NEEDS TWO 20 AMP CKT. BKRS.
204. RFI FILTERS ARE OPTIONAL. MAY NOT BE NEEDED.

SECURE VOICE (AUTOVON)
2W & 4W INSTL. DETAILS

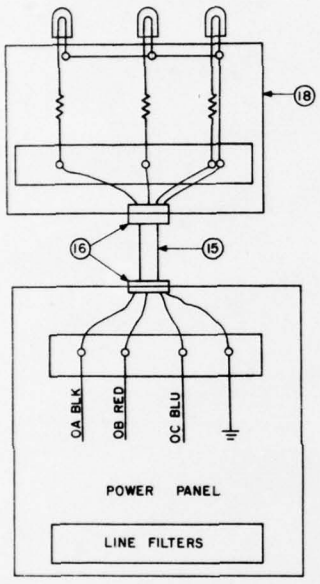
IDENT NO STD-MS-0016 SHEET 2 OF 8	SIZE D	FSCM NO 50470	DRAWING NO
DRAWN BY P. KARLEN 31 JUL 78	SCALE 1/2" = 1'-0"	1"	SHEET OF
APPROVED BY			


8
7
6
5
4
D
C
B
A
SEE NOTE 302
FAX 412 F/G
270 B DISCONNECT, RINGER, (& 4-WIRE AUTOVON)
502 PHONE (5)
TRANSMIT CONTROL BOX FOR 4-WIRE ONLY
T-1
T-2
RED PWR PANEL
RED POWER
RED SIGNAL
KG 34
BLACK SIGNAL
SEE NOTE 301
T-3
T-4
3/4" CONDUIT (41)
BLK PWR PANEL
MODEM & DAA
1 1/2" CONDUIT (28)
T-6
DISCHARGE FILTER UNIT
POWER PANEL
LINE FILTERS
VIEW C-C
FILTER DISCHARGE UNITS (18)
CEILING
RED TECH POWER PANEL
UTILITY POWER PANEL
FLOOR
SECTION A-A
VIEW B-
PLUGMOLD / CONDUIT LAYOUT

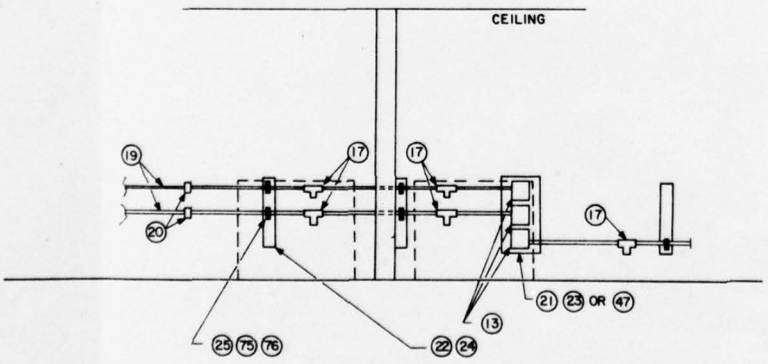
REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED



DISCHARGE FILTER UNIT



VIEW C-C



VIEW B-B

NOTES:

301. CY-3397 CAN BE PLACED IN THE SAME ROOM PROVIDING RED/BLACK SEPARATION IS MAINTAINED. SEE SHEET 7 FOR DETAILS.

302. CONDUIT CAN BE REPLACED WITH DUCT SYSTEM. CONDUIT IS RECOMMENDED WHEN GOING FROM ONE ROOM TO ANOTHER.

PLUGMOLD / CONDUIT LAYOUT

ITEM	AEL	DESCRIPTION	NSN	UI	QTY

LIST OF MATERIALS

NEXT ASSEMBLY	USED ON
DWG INDEX NO:	

IDENT NO STD-MS-0016 SHEET 3 OF 8

ORGANIZATION: U S ARMY COMMUNICATIONS-ELECTRONICS ENGINEERING INSTALLATION AGENCY

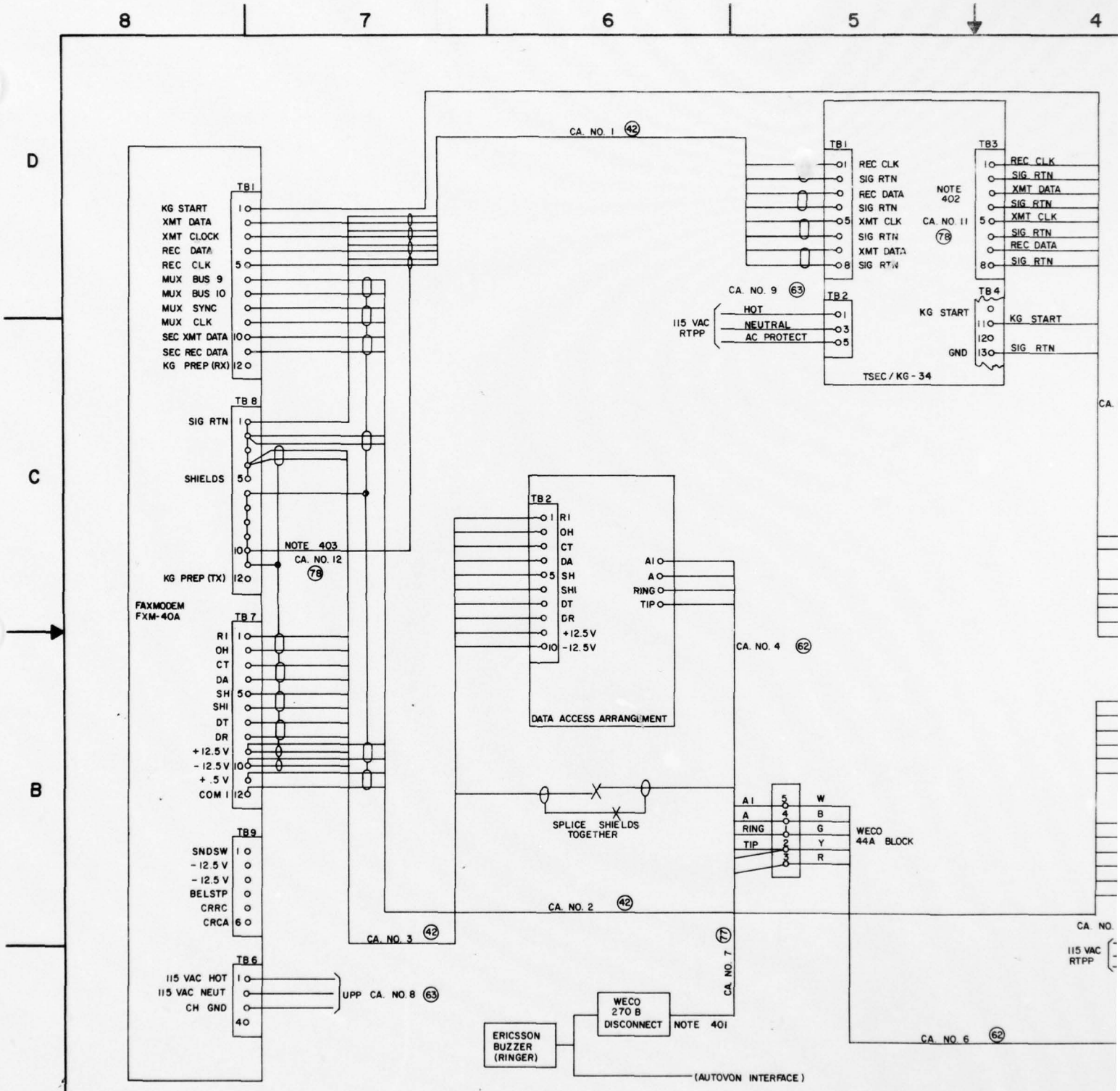
DESIGNED BY	C. CORNE	DATE 19JUL78
DRAWN BY	D. KARLEN	28JUL78
CHECKED BY		17AUG78
APPROVED BY		31Aug78
DESIGN ACTIVITY	CCC-CED-XEP	

SECURE VOICE (AUTOVON) 2W & 4W INSTL DETAILS

SIZE D | FSCM NO 50470 | DRAWING NO

SCALE NONE | SHEET OF

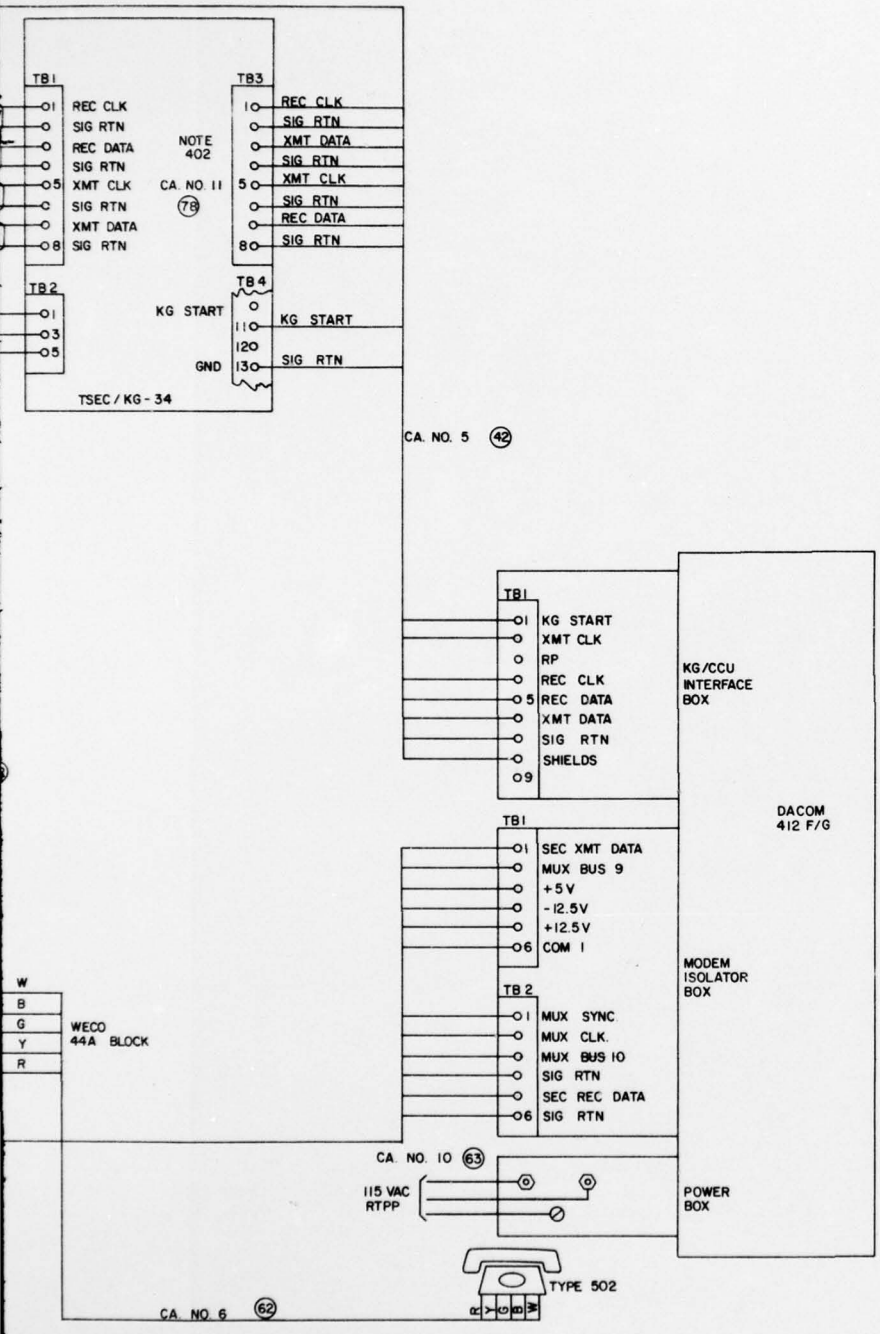
2



2 WIRE WIRING DIAGRAM

1

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED



NOTES :

401. USE BSP SEC 529-122-101, ISSUE 2 FOR INSTALLATION OF THE 270 B.

402. CA. NO. 11 GND ALL EVEN TERMINALS ON TB-3 TO RED GND BOX USING A # 10 AWG.

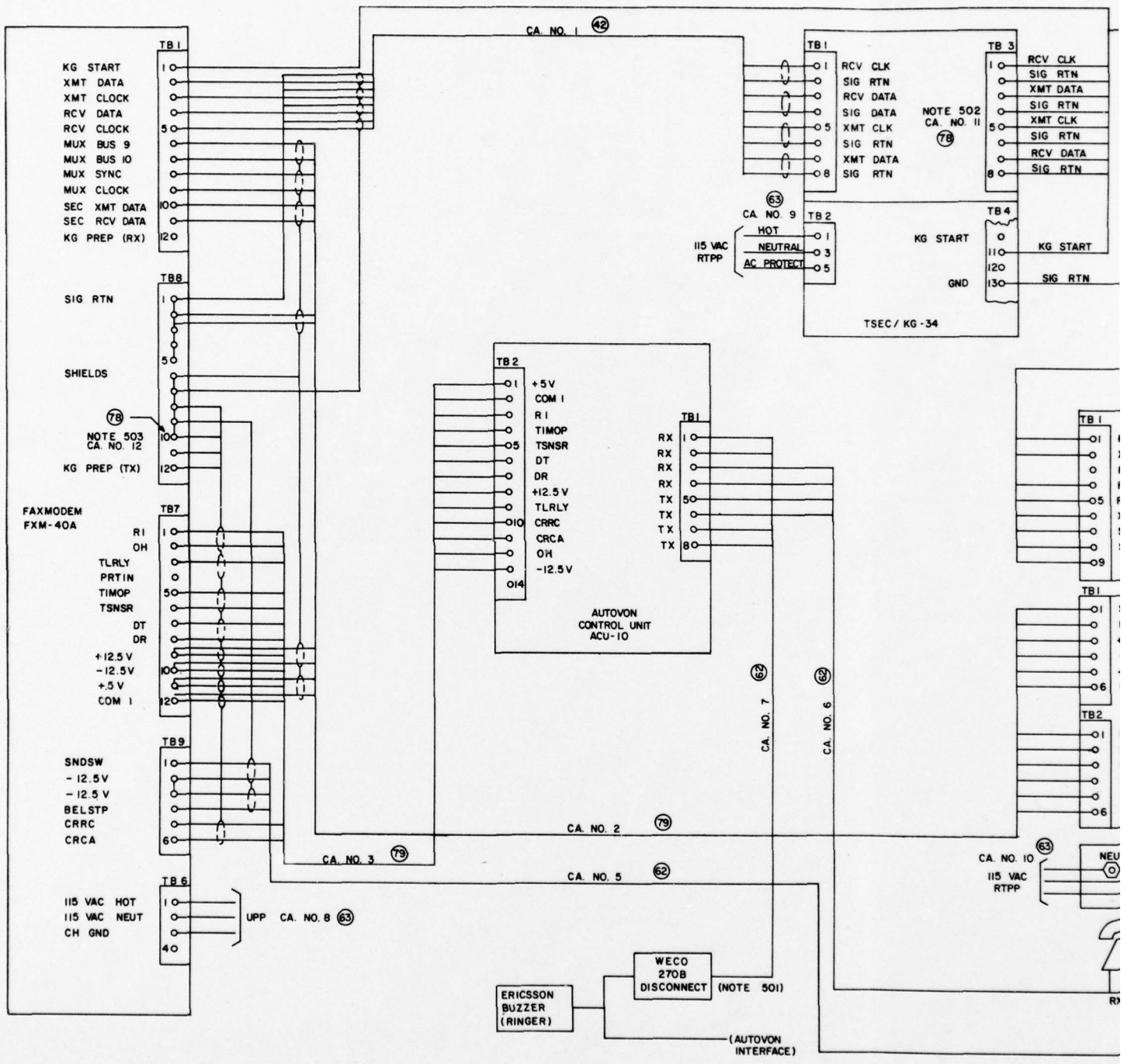
403. CA. NO. 12 GND TERMINAL 10 OF TB-8 TO BLK GND BOX USING A # 10 AWG.

G DIAGRAM

SECURE VOICE (AUTOVON)
2W & 4W INSTL DETAILS

IDENT NO	SIZE	FSCM NO	DRAWING NO
STD-MS-0016 SHEET 4 OF 8	D	50470	
DRAWN BY D. KARLEN 20 JUL 78	SCALE NONE		SHEET OF
APPROVED BY			

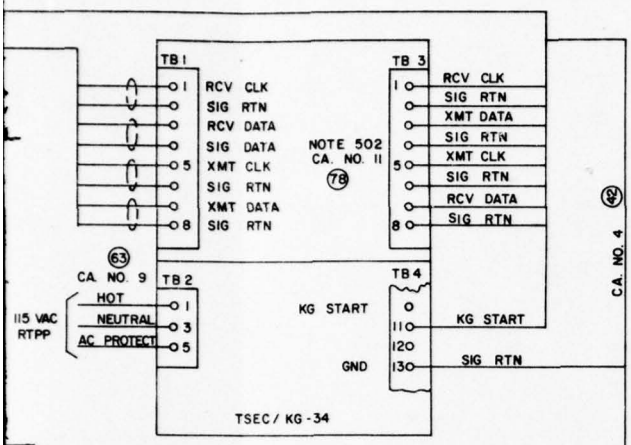
2



4 WIRE WIRING DIAGRAM

1

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED

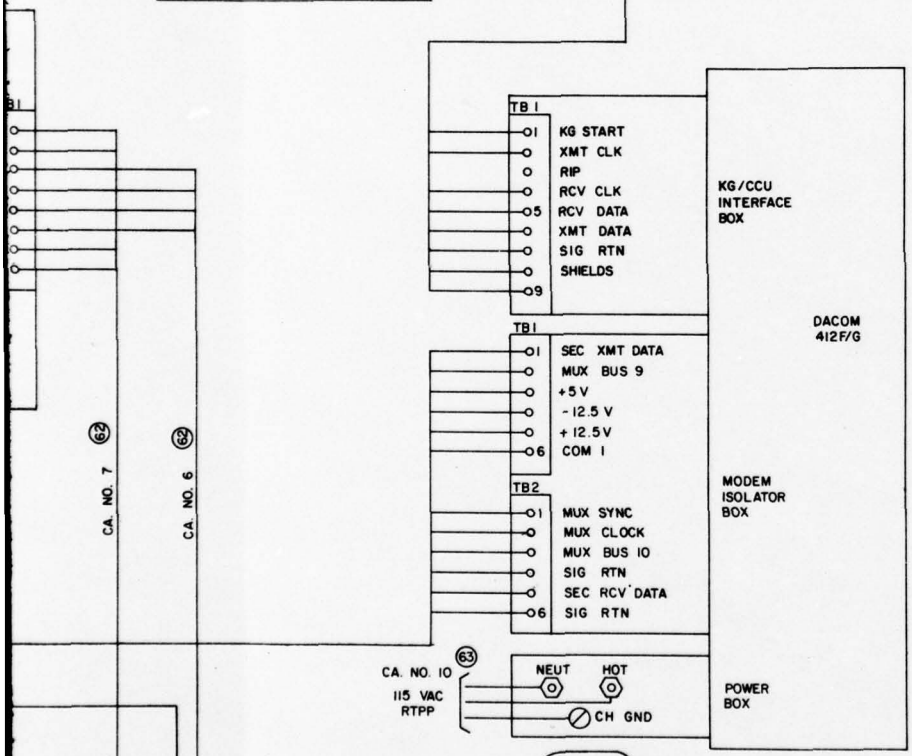


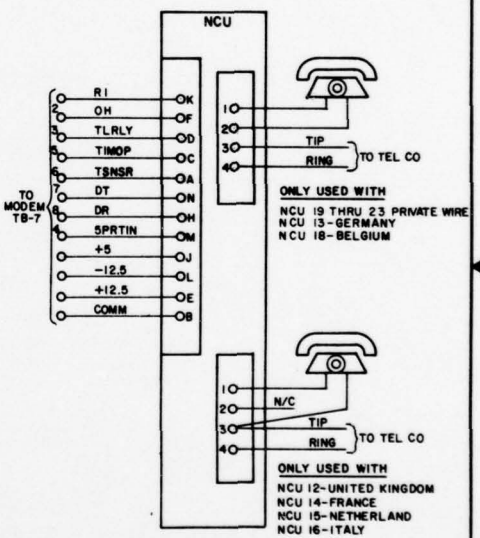
NOTES:

501. USE BSP 529-122-101, ISSUE 2 FOR INSTALLATION OF THE 2708.

502. CA. NO. 11 GND ALL EVEN TERMINALS ON TB-3 TO RED GND BOX USING A # 10 AWG.

503. CA. NO. 12, TERMINAL #10, OF TB-8 TO BLK GND BOX USING A # 10 AWG.





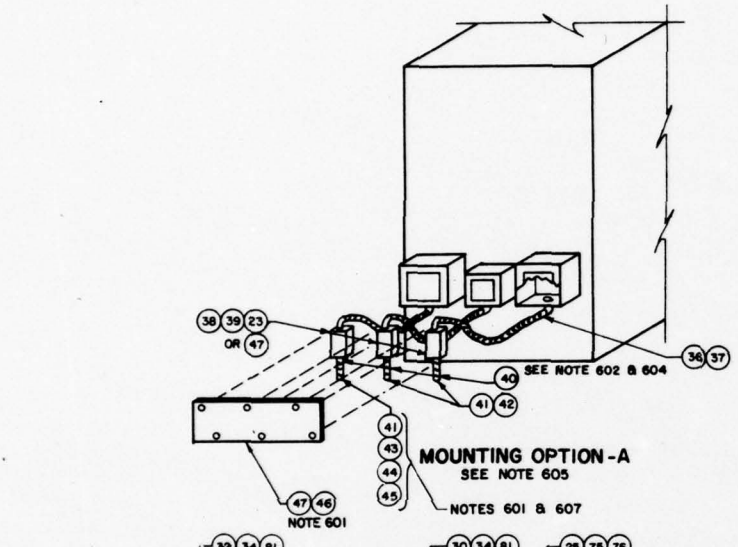
NETWORK CONTROL UNIT CONNECTIONS
TO
EUROPEAN COMMERCIAL CIRCUITS

DIAGRAM

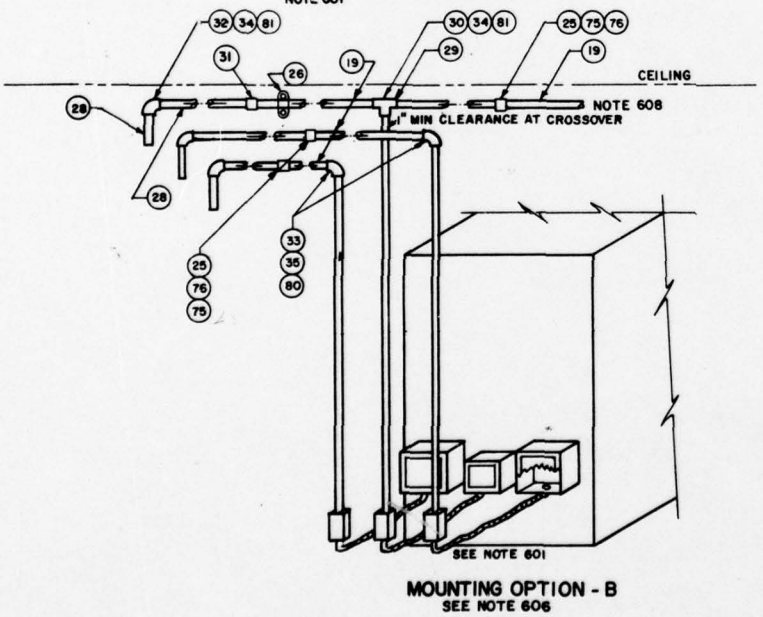
IDENT NO STD-MS-0016 SHEET 5 OF 8	SIZE D	FSCM NO 50470	DRAWING NO
DRAWN BY D. KARLEN	SCALE NONE	1"	SHEET OF
APPROVED BY [signature] 24 Aug 78			

SECURE VOICE (AUTOVON)
2W & 4W INSTALLATION DET

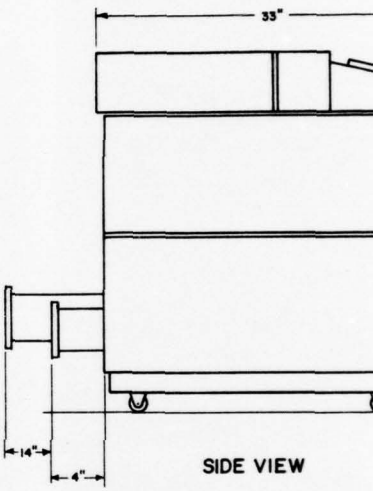
PRINT IN USACEEIA EDC



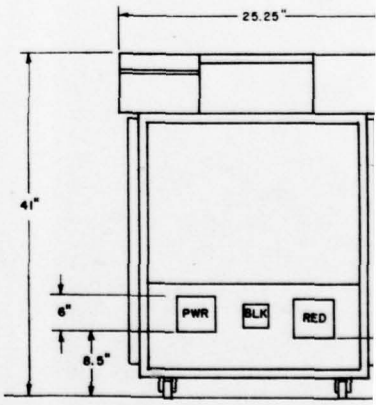
MOUNTING OPTION - A
SEE NOTE 605



MOUNTING OPTION - B
SEE NOTE 606



SIDE VIEW

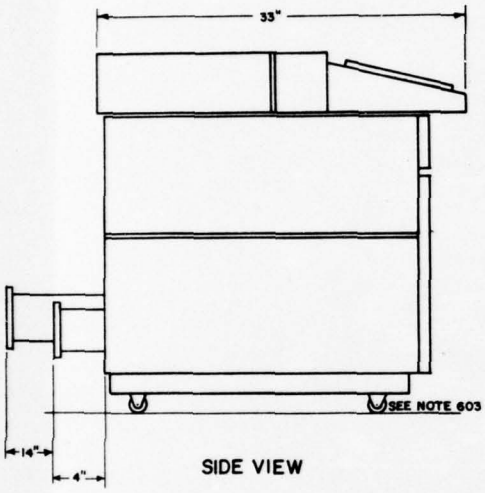


REAR VIEW

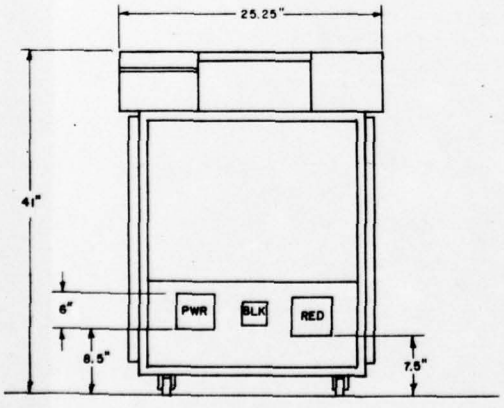
412 FACSIMILE
INSTALLATION DETAILS

1

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED



SIDE VIEW



REAR VIEW

NOTES:

601. MOUNT EACH CONDULET BOX CLOSE TO THE RAISED FLOOR (AS PER MOUNTING OPTION-A OR-B) AND VIA THE TWO LUGS ATTACH TO 2"x6"x2' LUMBER ON THE WALL; INSTALL FLEXIBLE METAL CONDUIT TO THE FACSIMILE SET.

602. CONNECTORS AND CONDUIT ASSEMBLY, METAL FLEXIBLE 6' LONG ARE TO BE INSTALLED BETWEEN THE CONDULET BOX AND THE DACOM FAX 412.

603. THE DACOM FAX 412 IS MOUNTED ON CASTORS.

604. IN ALL CASES CONDUITS WILL BE MOUNTED ON THE BOTTOM.

605. MOUNTING OPTION-A IS FOR FLOOR EGRESSING CONDUITS & CABLES.

606. MOUNTING OPTION-B IS FOR CEILING EGRESSING CONDUITS & CABLES.

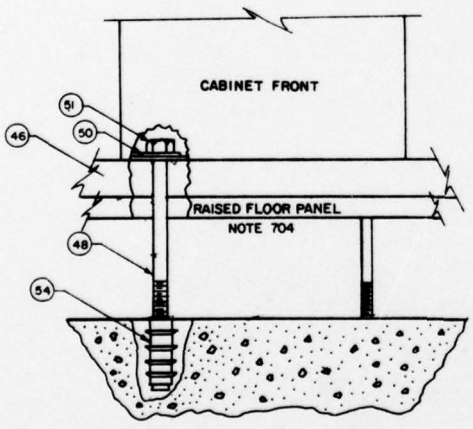
607. * FOR ITEMS 41, 42, 43, 44 & 45 PROVIDES 2 QUANTITIES, FIRST ONE IS FOR OPTION-A; SECOND IS FOR OPTION-B.

608. CONDUIT RUNS MAY BE MADE IN THE ATTIC.

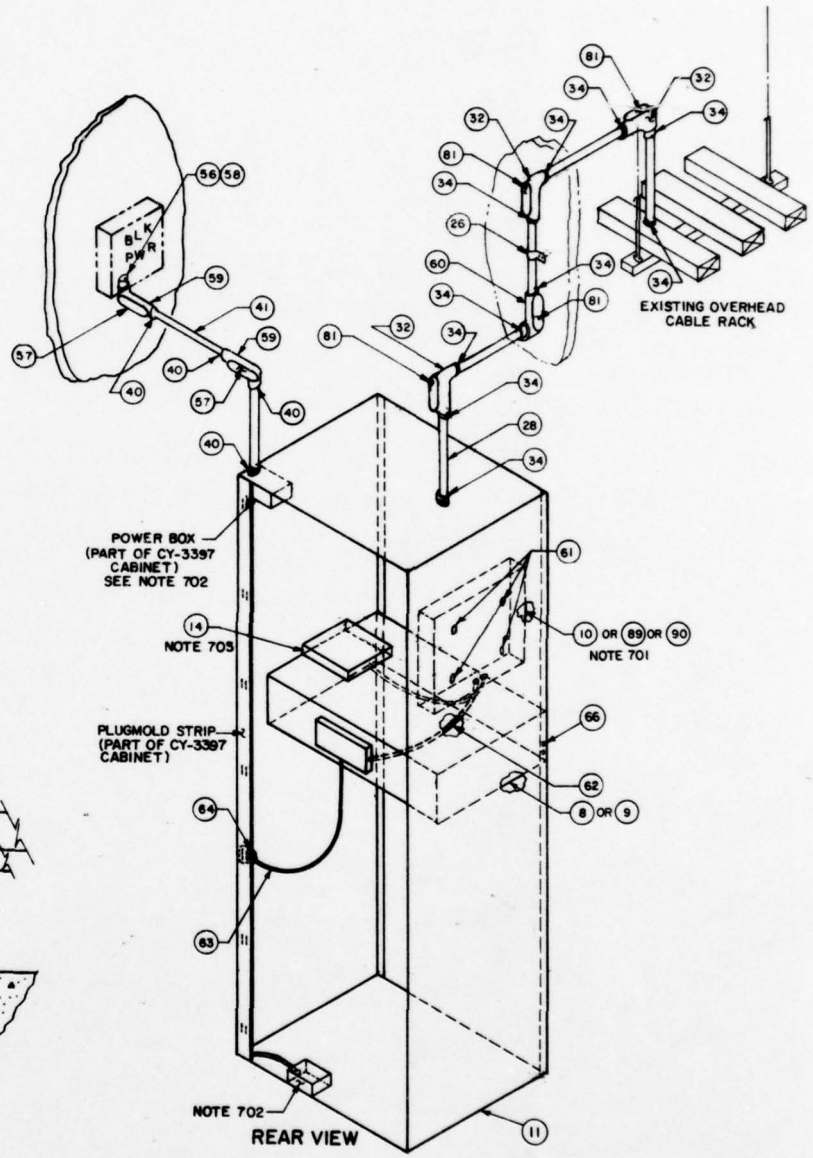
ACSIMILE
ON DETAILS

IDENT NO STD-MS-0016 SHEET 8 of 8	SECURE VOICE (AUTOVON) 2W & 4W INSTALLATION DETAILS		
DRAWN BY J.W. JOHNSTON	SIZE D	FSCM NO 50470	DRAWING NO
APPROVED BY [illegible]	SCALE NONE	1"	SHEET OF

PATENT IN USA 1973



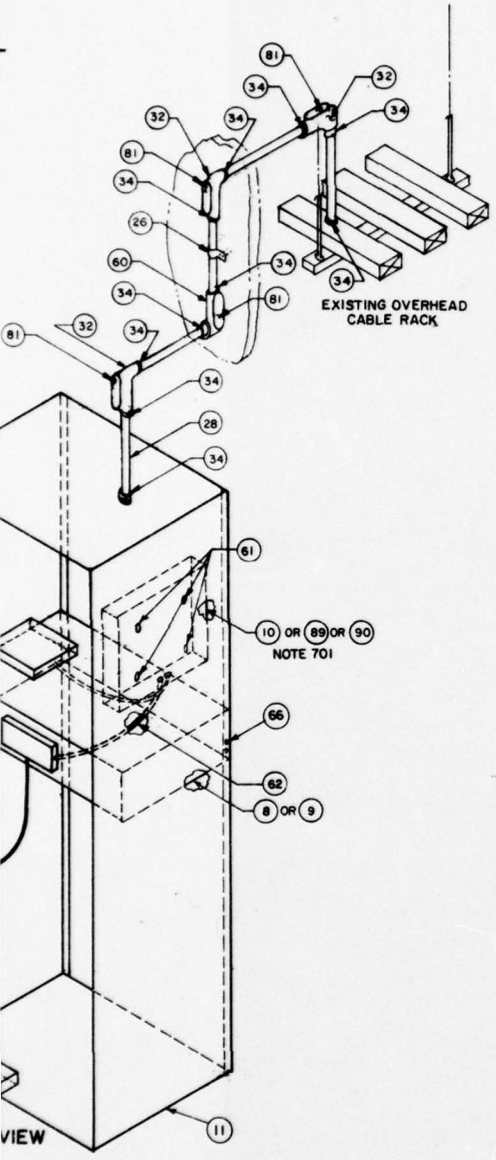
RACK/CABINET MOUNTING
ON RAISED FLOOR



REAR VIEW

DAA & MODEM/CABINET MOUNTING

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED



VIEW

TING

NOTES:

701. DRILL .190 HOLES IN SIDE OF CABINET AND ATTACH DAA TO INSIDE OF CABINET. LONGEST DIMENSIONS IN VERTICAL PLANE. LEAVE ENOUGH SLACK IN CABLE TO ALLOW TOP PANEL OF MODEM TO BE REMOVED. NCU-10 REQ 3 HOLES.

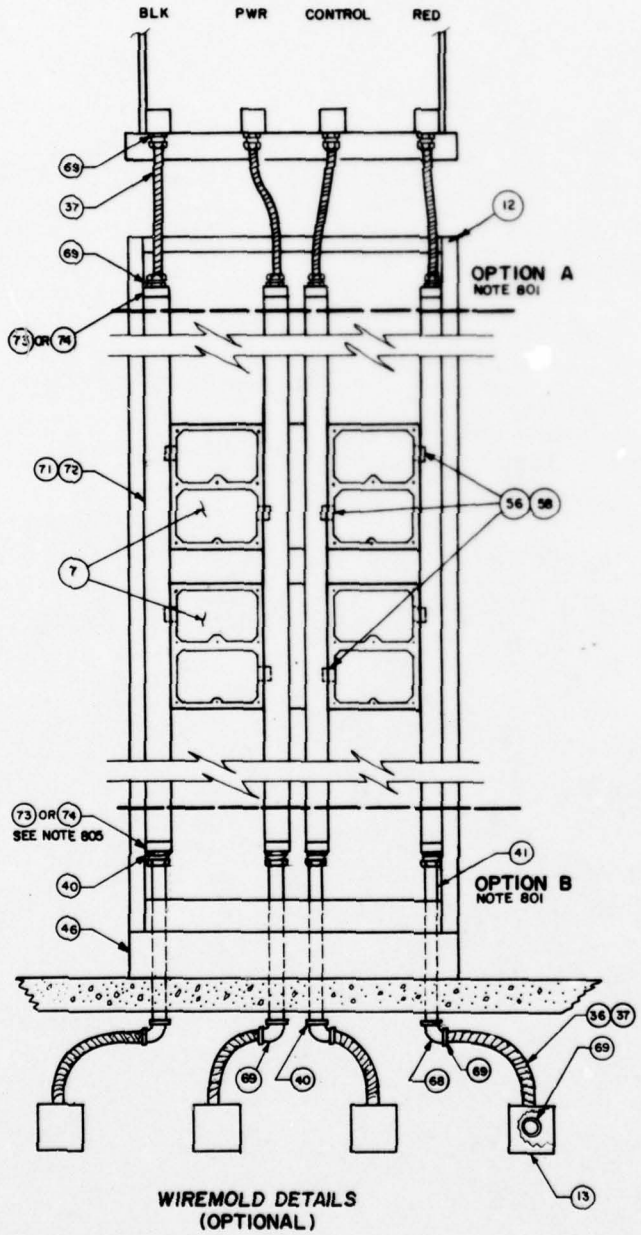
702. FOR CONDUIT ENTERING THE CY-3397 CABINET FROM THE TOP! REMOVE THE POWER BOX FROM BOTTOM OF CABINET AND REVERSE POWER STRIP. MOUNT POWER BOX ON TOP OF CABINET.

703. ITEM 14 WILL BE LAID ON TOP OF THE MODEM (2 WIRE INSTALLATION ONLY) IN A HORIZONTAL POSITION.

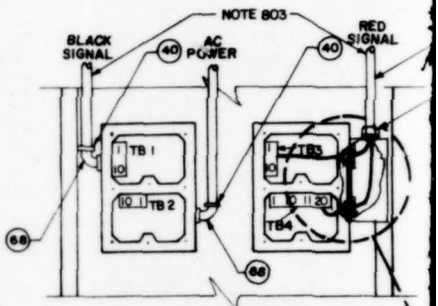
704. IN AREAS WITH RAISED FLOORS, THE JUNCTION BOX (ITEM 13) WILL BE MOUNTED UNDERNEATH THE FLOOR AND BOTH SIGNAL AND POWER CONDUITS WILL ENTER THROUGH BOTTOM OF CABINET.

IDENT NO STD-MS-0016 SHEET 7 OF 8	SECURE VOICE (AUTOVON) 2W & 4W INSTALLATION DETAILS	
DRAWN BY J.W.JOHNSTON	SIZE D / FSCM NO 50470	DRAWING NO
APPROVED BY	SCALE NONE	SHEET OF

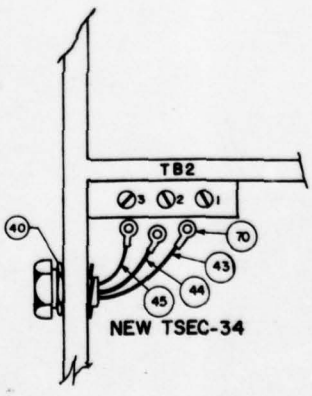
2

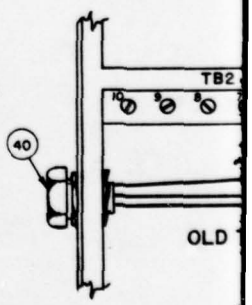


WIREMOLD DETAILS
(OPTIONAL)



CONDUIT DETAIL
(OPTIONAL)
REAR VIEW

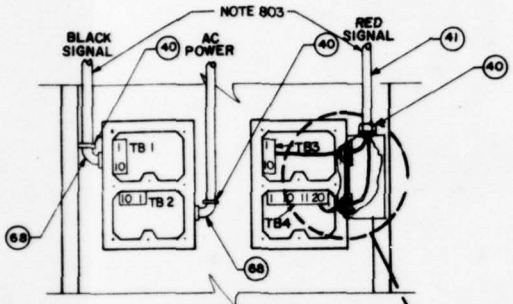




AC WIRING FOR TSEC/KG-34

TSEC/KG-34 INSTALLATION DETAILS
WIREMOLD or CONDUIT

REVISION				
ZONE	REV	DESCRIPTION	DATE	APPROVED



CONDUIT DETAIL
(OPTIONAL)
REAR VIEW

NOTES:

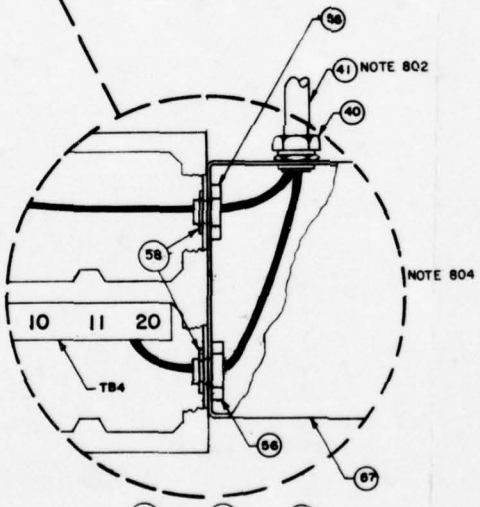
801 OPTION A - RUN CONDUIT FROM EXISTING OVERHEAD STRUCTURE. OPTION B IS UNDER FLOOR. BOTH OPTIONS ARE WITH WIREMOLD CONNECTED TO THE KG-34 USING ITEM 56 & 58.

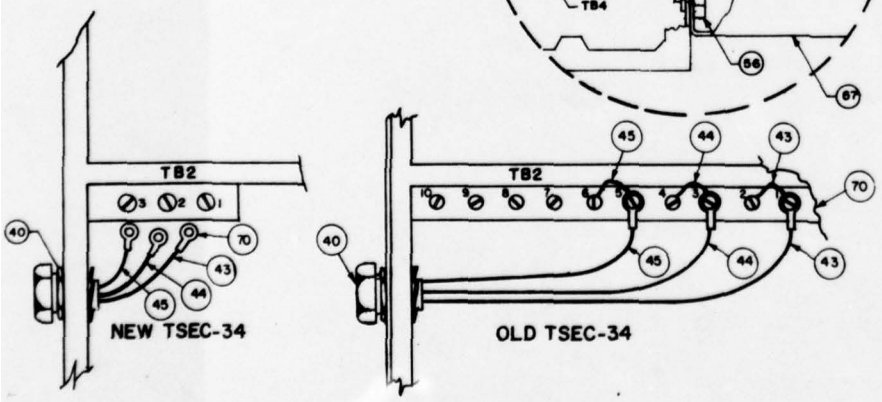
802. $\frac{3}{4}$" CONDUIT MAY ENTER FROM BOTTOM OF JUNCTION BOX ALONG WITH CONDUIT TO TB-1 AND TB-2 WHEN COMING FROM UNDER FLOOR.

803. RED AND BLACK GROUNDS, FROM THEIR RESPECTIVE SIGNAL GROUND BOXES MAY BE RUN IN THE RED AND BLACK CONDUITS OR WIREMOLD RESPECTIVELY.

804. DRILL HOLES FOR KG CABLE ENTRANCE AT AUTHORIZED KNOCK OUTS ONLY.

805. CABLE ENTRANCE MAY BE FROM OVERHEAD OR UNDER FLOOR. USE ITEM 77 AT TOP OF WIREMODE AND ITEM 76 AT BOTTOM OF WIRE MOLD FOR OVERHEAD ENTRANCE AND REVERSE ITEMS FOR UNDER FLOOR ENTRANCE.





AC WIRING FOR TSEC/KG-34

STALLATION DETAILS
or CONDUIT

IDENT NO STD-MS-0016 SHEET 8 OF 8		SECURE VOICE (AUTOVON) 2W & 4W INSTALLATION DETAILS	
DRAWN BY J.W.JOHNSTON	SIZE D	FSCM NO 50470	DRAWING NO
APPROVED BY	SCALE NONE	1"	SHEET OF

SECTION 5. BILL OF MATERIALS

5.1 GENERAL. The BOM provided on sheet 1 of STD-MS-0016 will be used to order the materials to accomplish the installation of the equipment described in this SEIP.

5.2 AUTHORIZED EQUIPMENT LIST. The BOM consists of materials current with the SML and publication of this document. Justified changes to the BOM will be submitted to Commander, HQ, USACEEIA, for up-date action. Identification of items are primarily by SML, identification number, and national stock number. When numbers are not available, the manufacturer's part description and number, or catalog number with appropriate cost, will be provided.

SECTION 6. QUALITY ASSURANCE PROCEDURES

6.1 GENERAL. The quality assurance (QA) criteria defined in CCR 702-1-2, appendix F, will be applied to this project. The QA procedures in this section will be used to determine the acceptability of the installation and the functional performance as defined in sections 1 and 3.

6.2 INSPECTION RESPONSIBILITIES.

6.2.1 Installation agency. The installation agency is responsible for quality control (QC) inspections in accordance with the provisions of CCR 702-1-2, T.O. 31-10 Series and applicable sections of this SEIP. QC inspections will be performed to ensure compliance with equipment, subsystem, and system level requirements. A QC representative (QCR) shall be identified, prior to start of installation, to serve as a point of contact for the QC effort. The QCR is responsible for ensuring the following actions are accomplished in a timely manner.

a. Complete the QA checklist, figure 6-1, during QC inspections, in accordance with CCR 702-1-2.

b. Prepare QC reports using approved installation agency forms.

c. Provide test equipment.

d. Perform shakedown tests and maintain a daily log of results using approved installation agency forms.

e. Issue a statement of readiness, certifying the installation is ready for acceptance testing, to the applicable USACEEIA QA element in writing, 20 days prior to the estimated completion date of shakedown tests.

f. Identify one installer to assist in the final QA inspection and acceptance test.

g. Correct QC discrepancies and perform installation rework if test results are not satisfactory.

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 1 OF 11 PAGES DATE (Day, Mo, Year)
SITE	LOCATION
PROJECT NAME	TASK NO.

REFERENCED T.O. FOR QUALITY OBSERVATIONS FOLLOW MAIN PARAGRAPHS	YES	NO	NA
A. Drawings and Specifications (AFTO 31-10-3, 31-10-9, 31-10-27, 31-10-29)			
1. Are floor plan drawings available?			
2. Are equipment location drawings available?			
3. Are face layout drawings of equipment in bays available?			
4. Are drawings for distribution frame block assignments available?			
5. Are pin connections on terminal blocks shown on drawings?			
6. Is stenciling of terminal blocks shown on drawings?			
7. Are drawings of power distribution equipment available?			
8. Are wire sizes indicated on drawings?			
9. Are schematic diagrams of circuit types to be installed included in drawings?			
10. Are drawings of site grounding systems available?			
11. Are drawings showing arrangement of cable racks, ducts, and trenches available?			
12. Do specifications contain list of reference material required by installers?			
13. Do specifications contain cable running list for power distribution?			
14. Do specifications contain cable running list for signal cabling?			

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Figure 6-1. QA Insepction Checklist - Installation.

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 2 OF 11 PAGES

	YES	NO	NA
15. Do specifications contain cable running list for RF cabling?			
16. Do specifications contain detailed information on grounding?			
17. Do specifications contain details on all special instructions for installers?			
18. Do drawings reference all applicable items on BOM?			
B. Tools and Equipment (AFTO 31-10-29)			
1. Is equipment damaged or unserviceable?			
2. Are all installation materials on hand and serviceable?			
3. Are all tools necessary for completion of the job on hand?			
4. Is all test equipment needed for test and checkout of installation available?			
C. General Safety Practice (AFTO 31-10-29)			
1. Are goggles being worn when drilling and grinding?			
2. Are sharp edges left on frame or duct work?			
3. Are all hand tools properly used?			
4. Are electric power tools properly grounded?			
D. Floor Plan Layout (AFTO 31-10-9, 31-10-29)			
1. Are equipment layout plans in accordance with drawings?			
2. Was layout plan completed before equipment was moved into area?			
E. Erecting and Mounting (AFTO 31-10-29)			
1. Is equipment laid out in accordance with floor plan drawing?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 3 OF 11 PAGES

	YES	NO	NA
2. Are equipment bays level and plumbed within tolerances?			
3. Has proper spacing been provided between equipment racks?			
4. Are base angles of frames secured to floor in proper location?			
5. Are all cabinets flush mounted and plumbed?			
6. Has finish of equipment, cabinets, and racks been touched up?			
7. Are bolts and screws free from stripped threads and defaced heads?			
8. Have sufficient clearances been provided between apparatus for heat dissipation?			
9. Are terminal blocks aligned on distribution frames?			
10. Has equipment been installed in cabinets or racks in accordance with face layouts?			
11. Are all nuts and bolts securely tightened?			
12. Are exposed or cut ends of metal filed smooth and painted?			
13. Have lock and flat washers been used?			
14. Is the C-E equipment BOM available at the facility?			
15. Has the C-E equipment been inventoried and discrepancies posted?			
16. Is all required C-E equipment at the site?			
17. Is all C-E equipment installed?			
F. Cable Racks (AFTO 31-10-6)			
1. Location of cable racks:			
a. Are cable racks located in accordance with cable plan drawing?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 4 OF 11 PAGES		
	YES	NO	NA
b. Does height of cable racks conform to height above floor as indicated on cable plan drawing?			
c. Are cable racks located so that clearance is provided for installation and maintenance of ultimate equipment?			
d. Are cable racks located so cables are not subject to damage or exposure or other detrimental conditions?			
2. Assembly of cable racks:			
a. Are long sections of cable racks used where possible?			
b. Have clamping details been altered other than where necessary to avoid interference?			
c. Are open ends of cable racks properly closed?			
d. Are vertical cable racks properly terminated on floors?			
3. Support of cable racks:			
a. Are cable racks properly supported and fastened?			
b. Are cable racks installed so that no excessive load or binding is imposed on the equipment?			
c. Are horizontal cable racks supported on approximately 5 feet centers but not to exceed 6 feet?			
d. Has support been provided within 3 feet of free end of cable rack?			
e. Are cable racks braced where necessary to prevent sway?			
G. Running Cable (AFTO 31-10-13)			
1. Are cable runs made in accordance with cable running list?			
2. Are cables twisted or crossed on cable rack?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 5 OF 11 PAGES

	YES	NO	NA
3. Do cables at turns or bends conform to the bending radii and position?			
4. Is protection provided where cable sheaths contact rough or sharp edges or metal?			
5. Are cables which are turned off over side of cable racks formed with minimum allowable radii?			
6. Are cables turned off rack horizontally and then up?			
7. Do cables to the distribution frame enter on the vertical side?			
8. Are cables serving the horizontal side of a distribution frame secured to the transverse arms near the vertical upright?			
9. Are cable tags properly prepared and in accordance with the cable running list?			
10. Are cable tags secured at each end of cable run?			
11. Have cable tags been removed upon completion of verification and termination?			
12. Are cable butts located as near as practicable to the point where the first wires turn out?			
13. Are cable butts properly treated?			
14. Is insulation of wires undamaged at butt location?			
15. Are unused and spare wires protected at butt location?			
H. Securing Cable (AFTO 31-10-2, 31-10-13)			
1. Is starting stitch properly made and placed?			
2. Is required Kansas City stitch properly made?			
3. Are first and succeeding layers of cable properly secured?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 6 OF 11 PAGES

	YES	NO	NA
4. Are cables secured at every cable rack cross strap?			
5. When cable butt is between securing devices, are cables secured together with an appropriate stitch?			
6. Are lock stitches properly made and spaced?			
7. Are splices in twine properly made?			
I. Sewed Forms (AFTO 31-10-13)			
1. Is proper size twine used for the diameter of the form?			
2. Are proper number of strands used?			
3. Are stitches properly spaced?			
J. Butting and Stripping (AFTO 31-10-13)			
1. Are proper tools used for butting and stripping of cable?			
2. Are cable butts properly dressed?			
3. Is proper distance maintained from cable butt to fanning strip?			
K. Fanned Forms (AFTO 31-10-2)			
1. Are cables fanned and connected to the left side of vertical mounted terminal blocks and to the bottom of horizontal terminal blocks?			
2. Are conductors in fanned forms twisted and bunched?			
3. Are fanned forms straight and taut from butt location to fanning strip?			
4. Is length of skinners correct?			
5. Has color code been properly followed?			
6. Are spare wires disposed of properly?			
L. Stenciling (AFTO 31-10-27, 31-10-29)			
1. Is equipment correctly identified and stenciled in accordance with floor plan drawings?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 7 OF 11 PAGES		
	YES	NO	NA
2. Are designations located correctly?			
3. Are correct size designations used on particular types of apparatus or equipment?			
M. Strapping (AFTO 31-10-16)			
1. Are straps properly placed?			
2. Is correct type of strap wire used?			
3. Does insulation extend to terminal?			
4. Are straps placed so as not to interfere with operation of apparatus?			
5. Is removal of apparatus blocked?			
6. Are designations of apparatus obscured?			
N. Connecting and Soldering (AFTO 31-10-7)			
1. Is soldering clamp used when connecting wires?			
2. Are connections made on terminal blocks in proper manner?			
3. Is all soldering done with standard rosin core solder?			
4. Are connections secure and free of foreign substances?			
5. Has all unsightly flux and excess globules of solder been removed?			
6. Is insulation on skinners burnt or otherwise damaged?			
7. Do skinners on connected terminals exceed 1/16 in?			
8. Are all conductors given a continuity test after connection is made?			
O. Wrapped Connections (AFTO 31-10-7)			
1. Are wrapped connections applied only on suitable terminals?			
2. Are connections essentially straight and free of angular bends or crimps?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 8 OF 11 PAGES		
	YES	NO	NA
3. Are the required number of turns in contact with the terminal in accordance with criteria for gauge of wire used?			
4. Are wrapped connectors soldered where applicable?			
P. Cross Connections (AFTO 31-10-11)			
1. Are jumpers properly routed at distribution frame?			
2. Do jumpers have sufficient slack after connection?			
3. Are conductors twisted between fanning strip and terminal?			
4. Does twist remain in conductors beyond rear of fanning strip?			
5. Are jumpers properly dressed?			
6. Has excess solder been removed from terminals?			
Q. Equipment and Signal Grounds (AFTO 31-10-24, 31-10-29)			
Are equipment and signal grounds installed in accordance with applicable codes and standards and in accordance with installation drawings?			
R. Conduit (AFTO 31-10-12)			
1. Are burrs removed from conduit after cutting?			
2. Is bending radii of conduit adequate?			
3. Are there more than four 90-degree bends in a single conduit run?			
4. Does number of conductors in conduit conform?			
5. Are conduits supported at intervals not exceeding 6 feet?			
6. Have all fittings been tightened after installation?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 9 OF 11 PAGES		
	YES	NO	NA
S. Ducts (RF Shieldings) (AFTO 31-10-12, 31-10-13)			
1. Are hangers for overhead ducts mounted first?			
2. Is proper type mallet used in assembly?			
3. Are flange sections cleaned before installation?			
T. Coaxial Cables (AFTO 31-10-14)			
1. Is cable inspected for possible damage prior to installation?			
2. Where required, is cable sewed in same manner as signal cable?			
3. Is butting and stripping done in same manner as signal cable?			
4. Do cable tags remain on coaxial cable from antenna to RF patch or equipment?			
5. Is support spacing of cables installed as prescribed (3 ft for cable 1-5/8 in or smaller and 5 ft for cables 1-11/16 in or greater)?			
6. Does bending radii of cables meet prescribed standards of the T.O.?			
U. Waveguides and Antennas (AFTO 31R-10-5, CEEIA PAM 105-3)			
1. Are waveguides stored in a horizontal manner and away from heavy objects?			
2. Are waveguides inspected for possible damage prior to installation?			
3. Are waveguides cleaned in the proper manner prior to installation?			
4. Are hangers installed every 5 feet as prescribed?			
5. Do waveguide bends conform to T.O. criteria?			
6. Are antennas and reflectors mounted as prescribed heights?			
7. Are antennas oriented to the prescribed azimuth?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 10 OF 11 PAGES

	YES	NO	NA
V. Outside Plant Inspection (AFTO 31R-10-5, 31-10-5, 31-10-3, 31-10-10, 31-10-21, 31-10-24, 31-10-28)			
1. Are antenna tower locations proper?			
2. Are footings or pads prepared prior to concrete pour?			
3. Have concrete pours for footings and pads been accomplished in accordance with specified criteria?			
4. Has proper cure time been achieved prior to mounting steel?			
5. Is the tower constructed in accordance with the specified criteria, drawings, etc?			
6. Are the antenna supports, anchors, pedestals, etc., properly installed in accordance with established criteria?			
7. Are supporting structures, guy wires, tower lighting kits (when required), termination boxes, and baluns included and properly installed in accordance with established criteria?			
8. Are antennas properly mounted and aligned?			
9. Were antenna reflectors properly aligned prior to mounting the feed horn?			
10. Are antenna curtains for rhombic and log periodics properly installed?			
11. Are transmission lines, coaxial cables, waveguides, etc., properly installed?			
12. Has tower and supporting structure been painted in accordance with established criteria?			
13. Are waveguides, cable runs, etc., properly installed and protected?			
W. Power Buildings (AFTO 31-10-3, 31-10-29)			
1. Are power buildings and pads properly located and installed?			

Figure 6-1. QA Inspection Checklist - Installation (Continued).

QUALITY ASSURANCE INSPECTION CHECKLIST - INSTALLATION (CCCR 702-2)	PAGE 11 OF 11 PAGES

	YES	NO	NA
2. Are generators and power distribution panels properly located and installed?			
3. Are oil pans properly installed?			
4. Are generators properly vented from the buildings?			
5. Has all required wiring been installed?			
6. Are fuel tanks installed above ground; if so, are they located at the proper distance from generator building?			
7. If fuel tanks were installed underground, was it accomplished in accordance with established procedures?			
8. Is safety equipment located in generator building?			
X. Installation Drawings (AFTO 31-10-29)			
Have drawings been reviewed to assure "as built" accuracy?			

TEST ENGINEER/QUALITY ASSURANCE REPRESENTATIVE (QAR)

Figure 6-1. QA Inspection Checklist - Installation (Continued).

h. Make QC inspection records and related installation documents available to the quality assurance representative/test director referred to as the QAR.

6.2.2 Testing agency. The testing agency is responsible for periodic in-process QA checks, final QA inspection and acceptance testing in accordance with provisions of CCCR 702-3. Quality assurance inspections will be performed to monitor the QC effort and to ensure the installation meets the required performance parameters at the equipment, subsystem, and system levels. A QAR will be identified, prior to start of installation, to serve as a point of contact for the QA and test effort and to ensure the following actions are taken in a timely manner:

a. Establish a QA program that monitors the QC and installation efforts to ensure compliance with stated requirements.

b. Record the information required by figure 6-2, pertaining to cognizant agency, command, and facility points of contact.

c. Review QC and installation records and perform periodic in-process QA inspections because of the size and complexity of the installation, and report discrepancies to the responsible agency. Recommendations for corrective action will be included in any discrepancy reports.

d. Perform a final QA inspection and complete the QA summary checklist, figure 6-3, in accordance with CCR 702-1-2.

e. Conduct functional performance tests, in accordance with section 7 of the SEIP, to determine if the installed equipment, subsystem, or system meets the required performance parameters. If the results of any portion of the acceptance test are not satisfactory, corrective action will be taken by onsite personnel. If discrepancies are resolved, the QAR may retest to verify the results and continue the acceptance test. If discrepancies cannot be corrected, the QAR may reject the equipment, subsystem, system, or attempt to complete the test with exceptions. Exceptions will be noted in the final test and acceptance report.

COGNIZANT AGENCY, COMMAND, AND
FACILITY QA POINTS OF CONTACT
(CCCR 702-2)

	Individual POC	Bldg. No.	Rm. No.	Phone No.	Name of Agency
Installation:					
Team Leader					
Assistant Team Leader					
Quality Control					
Quality Assurance Agency:					
Representative					
Testing Activity					
Operating Agency:					
Representative					
Site Commander					

Figure 6-2. QA Points of Contact.

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR 702-2)		PAGE 1 OF 7 PAGES DATE (Day, Mo, Year)
SITE	LOCATION	QUALITY CONTROL REPRESENTATIVE (QCR)
PROJECT NAME		TASK NO.

	YES	NO	NA
A. General Safety Practice			
1. Are goggles being worn when using grinding machines?			
2. Are sharp edges left on frame or duct work?			
3. Are all hand tools properly used?			
4. Are electric power tools properly grounded?			
5. Are ground wires securely attached?			
B. Floor Plan Layout			
1. Are layout plans in accordance with drawings?			
2. Was layout plan completed before equipment was moved into area?			
C. Erecting and Mounting			
1. Is equipment laid out in accordance with floor plan drawing?			
2. Are equipment bays leveled and plumbed within tolerances?			
3. Has proper spacing been provided between equipment racks?			
4. Are base angles of frames secured to floor in proper location?			
5. Are all cabinets flush mounted and plumbed?			
6. Has finish of equipment, cabinets, and racks been touched up?			
7. Are bolts and screws free from stripped threads and defaced heads?			

Figure 6-3. QC Checklists - Installation.

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2) | PAGE 2 OF 7 PAGES

	YES	NO	NA
8. Have sufficient clearances been provided between apparatus for heat dissipation?			
9. Are terminal blocks aligned on distributing frames?			
10. Has equipment been installed in cabinets or racks in accordance with face layouts?			
11. Are all nuts and bolts securely tightened?			
12. Are exposed or cut ends of metal filed smooth and painted?			
D. Cable Racks			
1. Location of cable racks:			
a. Are cable racks located in accordance with cable plan drawing?			
b. Does height of cable racks conform to height above floor as indicated on cable plan drawing?			
c. Are cable racks located so that clearance is provided for installation and maintenance of ultimate equipment?			
d. Are cables located so they are not subject to damage due to exposure or other detrimental conditions?			
2. Assembly of cable racks:			
a. Are long sections of cable racks used where possible?			
b. Have clamping details been altered other than where necessary to avoid interference?			
c. Are open ends of cable racks properly closed?			
d. Are vertical cable racks properly terminated on floors?			
3. Support of cable racks:			
a. Are cable racks properly supported and fastened?			
b. Are cable racks installed so that no excessive load or binding is imposed on the equipment?			

Figure 6-3. QC Checklists - Installation (Continued).

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2)	PAGE 3 OF 7 PAGES		
	YES	NO	NA
c. Are horizontal cable racks supported on approximately 5 feet centers but not to exceed 6 feet?			
d. Has support been provided within 3 feet or free end of cable rack?			
e. Are cable racks braced where necessary to prevent sway?			
E. Running Cable			
1. Are cable runs made in accordance with cable running list?			
2. Are oval shaped switchboard cables placed on edge?			
3. Are cables twisted or crossed on cable rack?			
4. Do cables conform to the bending radii and position at turns or bends?			
5. Is protection provided where cable sheaths contact rough or sharp edges or metal?			
6. Are cables turned off over side of cable racks formed with minimum allowable radii?			
7. Are cables turned off rack horizontally and then up?			
8. Do cables to the distributing frame enter on the vertical side?			
9. Are cables serving the horizonal side of a distributing frame secured to the transverse arms near the vertical upright?			
10. Are cable tags properly prepared and in accordance with the cable running list?			
11. Are cable tags secured at each end of cable run?			
12. Have cable tags been removed upon completion of verification and termination?			
13. Are cable butts located as near as practicable to the point where the first wires turn out?			
14. Are cable butts properly treated?			

Figure 6-3. QC Checklists - Installation (Continued).

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2)	PAGE 4 OF 7 PAGES

	YES	NO	NA
15. Is insulation of wires undamaged at butt location?			
16. Are unused and spare wires protected at butt location?			
F. Securing Cable			
1. Is starting stitch properly made and placed?			
2. Is required Kansas City stitch properly made?			
3. Are first and succeeding layers of cable properly secured?			
4. Are cables secured at every cable rack cross strap?			
5. When cable butt is between securing devices, are cables secured together with an appropriate stitch?			
6. Are lock stitches properly made and spaced?			
7. Are splices in twine properly made?			
G. Sewed Forms			
1. Is proper size twine used for the diameter of the form?			
2. Are proper number of strands used?			
3. Are stitches properly spaced?			
H. Butting and Stripping			
1. Are proper tools used for butting and stripping of cable?			
2. Are cable butts properly dressed?			
3. Is proper distance maintained from cable butt to fanning strip?			
I. Fanned Forms			
1. Are cables fanned and connected to the left side of vertical mounted terminal blocks and to the bottom of horizontal terminal blocks?			
2. Are conductors in fanned forms not twisted and bunched?			

Figure 6-3. QC Checklists - Installation (Continued).

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2)	PAGE 5 OF 7 PAGES

	YES	NO	NA
3. Are fanned forms straight and taut from butt location to fanning strip?			
4. Is length of skinners correct?			
5. Has color code been properly followed?			
6. Are spare wires disposed of properly?			
J. Stenciling			
1. Is equipment correctly identified and stenciled in accordance with floor plan drawings?			
2. Are designations correctly located?			
3. Are corrected size designations used on particular types of apparatus or equipment?			
K. Strapping			
1. Are straps properly placed?			
2. Is correct type of strap wire used?			
3. Does insulation extend to terminal?			
4. Are straps placed so as to not interfere with operation of apparatus?			
5. Is removal of apparatus not blocked?			
6. Are designations not obscured?			
L. Connecting and Soldering			
1. Is soldering clamp used when connecting wires?			
2. Are connections made on terminal in proper manner?			
3. Is all soldering done with standard resin core solder?			
4. Are connections secure and free of foreign substances?			
5. Have all unsightly flux and excess globules of solder been removed?			
6. Is insulation on skinners not burnt or otherwise damaged?			

Figure 6-3. QC Checklists - Installation (Continued).

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2)	PAGE 6 OF 7 PAGES

	YES	NO	NA
7. Do skinners on connected terminals not exceed 1/16 in?			
8. Are all conductors given a continuity test after connection is made?			
M. Transistor Soldering Techniques			
1. Is caution exercised to assure that excessive heat does not destroy transistors?			
2. Are safeguards in effect to prevent leakage current at the end of an electrical soldering iron from destroying transistors?			
N. Wrapped Connections			
1. Are wrapped connections applied only on suitable terminals?			
2. Are connections essentially straight and free of angular bends or cramps?			
3. Are the required number of turns in contact with the terminal in accordance with criteria for gauge of wire used?			
4. Are wrapped connectors soldered where applicable?			
O. Cross Connections			
1. Are jumpers properly routed at distribution frame?			
2. Do jumpers have sufficient slack after connection?			
3. Are conductors not twisted between fanning strip and terminal?			
4. Does twist remain in conductors beyond rear of fanning strip?			
5. Are jumpers properly dressed?			
6. Has excess solder been removed from terminals?			

Figure 6-3. QC Checklists - Installation (Continued).

QUALITY CONTROL CHECKLIST - INSTALLATION (CCCR-702-2)	PAGE 7 OF 7 PAGES

	YES	NO	NA
P. Equipment and Signal Grounds			
Are equipment and signal ground installed in accordance with applicable codes and standards and in accordance with installation drawings?			
Q. Conduit			
1. Are burrs removed from conduit after cutting?			
2. Is bending radii in accordance with AFTO 31-10-12?			
3. Are there no more than four 90 degree bends in a single conduit run?			
4. Does number of conductors in conduit conform to AFTO 31-10-12?			
5. Are conduits supported at proper intervals?			
6. Have all fittings been tightened after installation?			
R. Ducts (RF Shieldings)			
1. Are hangers for overhead ducts mounted first?			
2. Is proper type mallet used in assembly?			
3. Are flange sections cleaned before installation?			
S. Coaxial Cables			
Is cable inspected for possible damage prior to installation?			

Figure 6-3. QC Checklists - Installation (Continued).

f. Record and analyze test results, prepare a final test and acceptance report, and make distribution in accordance with CCCR 702-2.

6.2.3 Operating agency. The operating agency is responsible for providing support during installation and test. An operation and maintenance (O&M) representative shall be identified, prior to start of installation, to serve as the point of contact for the project and to ensure the following actions are taken in a timely manner:

a. Provide administrative supplies and typing support.

b. Assist in resolution of discrepancies.

c. Make O&M personnel available to assist on an as-required basis.

d. Provide a representative to witness the acceptance test and sign the technical acceptance recommendation (TAR).

6.3 DOCUMENTATION.

6.3.1 Quality control documentation. The installation QC will be documented using the QC checklist, figure 6-1, and the approved installation agency report forms. A QC inspection log will be maintained on a daily basis during inspection periods. The daily log may be in any format unless installation agency policy dictates otherwise.

6.3.2 Quality assurance documentation. The QA inspections will be documented using the cognizant agency, command, and facility points of contact form, figure 6-2, and the QA summary checklist, figure 6-3. The final QA inspection shall be documented using the TAR forms shown in section 8 of this SEIP. The test and acceptance report shall be in accordance with CCCR 702-2. A QA inspection log will be maintained on a daily basis during inspection periods. The daily log may be in any format unless testing agency policy dictates otherwise.

6.4 QUALITY ASSURANCE PLAN. The inspection responsibilities assigned in this section constitute the QA plan and establishes an independent evaluation loop. The evaluation loop consists of the installation agency QC effort and the testing agency QA and test effort. Acceptance of the installation by the O&M command

is contingent upon the successful demonstration, during acceptance testing, and the installed equipment meets required performance parameters. A coordinated effort between the installation, testing, and operating agency personnel is required to assure that the highest standards of quality are maintained.

6.4.1 Quality assurance notes.

6.4.1.1 Quality assurance inspections and tests may be interrupted at any point if disrupted by a hardware malfunction. They also may be interrupted at a compatible breaking point to permit scheduled duty breaks. Any inspection that is interrupted because of hardware malfunction shall be restarted at a point determined appropriate by the QAR.

6.4.1.2 Spare equipment may be substituted for malfunctioning equipment with the approval of the QAR. Any equipment which has been replaced shall be repaired and reinspected.

6.4.1.3 During acceptance tests, any piece of equipment, including cables, conduit, etc., may not be changed or adjusted without the approval of the QAR.

SECTION 7. TEST AND ACCEPTANCE PROCEDURES

7.1 SCOPE. This section provides for acceptance testing of the secure high-speed digital facsimile (DACOM Model 412). Equipment, subsystem, and system tests are performed to assure the equipment operates in accordance with performance parameters specified in this SEIP and supporting technical literature.

7.2 TEST CRITERIA. The criteria for acceptance is based on requirements stated in sections 1 and 3 of this SEIP, associated drawings, and technical specifications. If any of the test results fail to meet the desired performance parameters, corrective action will be taken by the responsible onsite engineering and installation personnel. Faulty equipment, cabling, or other installed BOM items, will be reworked and retested to ensure that faults have been corrected.

7.3 TEST EQUIPMENT.

7.3.1 Tools and test equipment required for shakedown testing will be identified and provided by the installation agency.

7.3.2 The acceptance test is a functional performance test requiring no tools or test equipment.

7.4 TEST PLAN ORGANIZATION.

7.4.1 Shakedown tests. Shakedown tests will be conducted and results recorded by the installation agency in accordance with normal installation agency policy and procedures. At least 16 hours of no-fault shakedown testing is required prior to the start of the acceptance test. Tests may be conducted in 8-hour increments to coincide with the normal duty day. The shakedown test should be in accordance with the following:

a. Key generator shakedown test (7.5.1.3) and test procedures, figure 7-1.

b. Key generator functional performance test (7.5.1.4) and test procedures, figure 7-2.

c. Facsimile functional performance test (7.5.2.3) and test procedures, figure 7-3.

KEY GENERATOR SHAKEDOWN
TEST PROCEDURES (TSEC/KG-34)

STEP NO.	TEST CONDITIONS	REQUIREMENT	OBSERVATION	ACCEPT	REJECT
1	Primary ac power characteristics	Tbl 1-5, pg 1-14 (Note 1)			
2	Environmental conditions	Tbl 1-8, pg 1-15			
3	Cable/connector compliance	Tbl 2-3, pg 2-8			
4	Element configuration	Par 2-4a, pg 2-3			
5	1/10 subassemblies	Par 2-4b, pg 2-3			
6	Power supply prep	Par 2-4c, pg 2-3			
7	Par 2-4d. pg 2-3	Par 2-4c, pg 2-3			
8	Par 2-4e, pg 2-3	Par 2-4e, pg 2-3			
9	Pre-power on checks	Par 3-3a, b, pg 3-3			
10	Power on	Tbl 3-1, pg 1 & 3-3, Par 3-3c, pg 3-3			

Figure 7-1. Key Generator Shakedown Test Procedures (sheet 1 of 2).

KEY GENERATOR SHAKEDOWN
TEST PROCEDURES (TSEC/KG-34)

STEP NO.	TEST CONDITIONS	REQUIREMENT	OBSERVATION	ACCEPT	REJECT
11	Par 3-3d, pg 3-3	Tbl 3-1, pg 3-1 & 3-3 Par 3-3d, pg 3-3			
12	Power off	Par 3-3e, pg 3-4			

NOTE 1: Referenced paragraphs are from KAM 237B/TSEC (C), unless otherwise noted.

Figure 7-1. Key Generator Shakedown Test Procedures (sheet 2 of 2).

KEY GENERATOR FUNCTIONAL PERFORMANCE
TEST PROCEDURES (TSEC/KG-34)

STEP NO.	TEST CONDITIONS	REQUIREMENT	OBSERVATION	ACCEPT	REJECT
1	Set up procedure	Par 2102, pg 12 (Note 1)			
2	Start up - power on	Par 3102a, pg 14			
3	New start	Par 3102b, pg 14			
4	Alarm clock	Par 3102c, pg 14			
5	Par 3102d, pg 14	Par 3102d, pg 14			
6	Par 3102e, pg 14	Par 3102e, pg 14			
(NOTE 2)		(NOTE 3)			
7	Establish test set-up	Tbl 1-4, par 1-5b, pg 1-5			
8	Par 1-5c, pg 1-5	Par 1-5c, pg 1-5			
9	Initial power on	Tbl 3-1, KAM 237B/TSEC, Tbl 1-5, steps 1 thru 1F			

Figure 7-2. Key Generator Functional Performance Test Procedures (sheet 1 of 3)

KEY GENERATOR FUNCTIONAL PERFORMANCE
TEST PROCEDURES (TSEC/KG-34) (Cont)

STEP NO.	TEST CONDITIONS	REQUIREMENT	OBSERVATION	ACCEPT	REJECT
10	Clock check	Tbl 3-1, KAM 237B/TSEC, Tbl 1-5, steps 2 thru 2B			
11	Alarm circuit check	Tbl 3-1, KAM 237B/TSEC, Tbl 1-5, steps 3 thru 31			
12	M 1 checks	Tbl 3-1, KAM 237B/TSEC, Tbl 1-5, steps 4 thru 41			
13	Tbl 1-5, steps 5 thru 5D	Tbl 1-5, steps 5 thru 5D			
14	Tbl 1-5, steps 6 thru 6H	Tbl 1-5, steps 6 thru 6H			
15	Tbl 1-5, steps 7 thru 7F	Tbl 1-5, steps 7 thru 7F			

Figure 7-2. Key Generator Functional Performance Test Procedures (sheet 2 of 3).

KEY GENERATOR FUNCTIONAL PERFORMANCE
TEST PROCEDURES (TSEC/KG-34) (Cont)

STEP NO.	TEST CONDITIONS	REQUIREMENT	OBSERVATION	ACCEPT	REJECT
16	Tbl 1-5, steps 8 thru 8F	Tbl 1-5, steps 8 thru 8F			
17	Tbl 1-5, steps 9 thru 9F	Tbl 1-5, steps 9 thru 9F			
18	Tbl 1-5, steps 10 thru 10D	Tbl 1-5, steps 10 thru 10D			
19	Tbl 1-5, steps 11 thru 11F	Tbl 1-5, steps 11 thru 11F			
20	Input signal	Tbl 1-6, KAM 237B/TSEC			
21	Output signal	Tbl 1-6, KAM 237B/TSEC			
22	Remote line characteristics evaluation (if applicable)	Tbl 1-7, KAM 237B/TSEC			

NOTE 1. Referenced paragraphs are from KAO-137C/TSEC (C), unless otherwise noted.
NOTE 2. Completion of this test procedure is unnecessary if steps 2 through 6 above are satisfactory.
NOTE 3. Referenced paragraphs are from KAM 238B/TSEC (C), unless otherwise noted.

Figure 7-2. Key Generator Functional Performance Test Procedures (sheet 3 of 3).

FACSIMILE FUNCTIONAL PERFORMANCE TEST PROCEDURE (DACOM MODEL 412)

STEP NO.	TEST CONDITIONS	REQUIREMENTS	OBSERVATION	ACCEPT	REJECT
1	Connect DACOM test set for full duplex, loopback mode of operation.	Facsimile unit can transmit document and receive it simultaneously.			
2	Transmit USACEEIA FM 116, facsimile test sheet (located at the end of this section, at 200 lines per inch (FINE DETAIL mode) with the secure/clear switch in the secure position).	Receive test sheet. Retain for evaluation and a comparison test with the original test sheet.)			
3	Following the operating instructions shown in appendix A, transmit the facsimile test sheet to a remote terminal. (NOTE: Transmission requires use of dial-up lines. If the line is unusually noisy, dial again to get a typical grade circuit.)	Obtain received copy from remote end for evaluation and use in a comparison test.			
4	Compare the copies obtained in steps 2 and 3 above, against the original facsimile test sheet. Evaluate each pattern against the following acceptance criteria.				

Figure 7-3. Facsimile Functional Performance Test and Data Sheets (sheet 1 of 5).

STEP NO.	TEST CONDITIONS	REQUIREMENTS	OBSERVATION	ACCEPT	REJECT
	a. Patterns A, B, and C	Acceptable if all patterns are distinguishable.			
	b. Pattern D	Acceptable if (11 in the upper row and 12 in the lower row) the black rectangles are visible as black or gray bars or if there is a complete outline of each bar.			
	c. Pattern E	Each of vertical lines must be visible and distinguishable from adjacent lines up to point 5. Ends of vertical lines may be faded so that only 70 percent of each line remains visible.			
	d. Pattern F	Acceptable if points 4, 5, and 6 are distinguishable.			
	e. Pattern G	Used to checking photo mode of operation (412-G). Acceptability of this pattern must be based on the tester's judgment rather than on specific acceptance criteria.			

Figure 7-3. Facsimile Functional Performance Test and Data Sheets (sheet 2 of 5).

STEP NO.	TEST CONDITIONS	REQUIREMENTS	OBSERVATION	ACCEPT	REJECT
	f. Patterns H	Acceptable if points 6, 8, and 10 are distinguishable.			
	g. Pattern I	Acceptable if the lines in the areas labeled 1 and 2 are visible and distinguishable. A blending of the lines and spaces into a continuous gray area should not occur within this range.			
5	Make adjustments to the equipment and repeat steps 3 and 4 above to obtain the best possible copies.	Same as steps 3 and 4.			
6	Make a subject comparison test between the original facsimile test sheet and copies obtained in steps 2 and 5 above.	The copies should not include obvious defects and distortions such as spots, discoloration, blurring, fading, jagged lines, etc.			

Figure 7-3. Facsimile Functional Performance Test and Data Sheets (sheet 3 of 5).

STEP NO.	TEST CONDITIONS	REQUIREMENTS	OBSERVATION	ACCEPT	REJECT
7	Transmit the test chart to the remote terminal at 100 lines per inch (QUALITY mode). Make a subjective comparison test between the copy and the original test sheet.	Acceptability is based on the discretion of the tester. Any obvious defects or distortions should be recorded.			
8	Repeat step 7 with transmit mode at 67 lines per inch (EXPRESS mode).	Same as step 7 above.			
9	Transmit the facsimile test sheet using the FILTER feature in conjunction with each of the transmit modes (EXPRESS, QUALITY and FINE DETAIL). Make a subjective comparison test between the copies and the original test sheet.	Same as step 7 above.			
10	Put the secure/clear switch in the clear position and repeat step 9 above. Also transmit without using the FILTER feature in each of the three resolution modes.	Same as step 7 above.			

Figure 7-3. Facsimile Functional Performance Test and Data Sheets (sheet 4 of 5).

STEP NO.	TEST CONDITIONS	REQUIREMENTS	OBSERVATION	ACCEPT	REJECT
11	Repeat the above procedures with the DACOM 412 equipment set up to receive the facsimile test sheet from a remote terminal.	Similar to steps 2 through 10.			
12	Transmit and receive a multipage document to verify correct operation of the MULTIPAGE feature. Make a subjective comparison of the copies and the original document.	Same as step 7 above.			

NOTE: Fill in the switch settings and other required information for which spaces are provided.

Figure 7-3. Facsimile Functional Performance Test and Data Sheets (sheet 5 of 5).

7.4.2 Acceptance test. The acceptance test will be conducted by the QAR after successful completion of shakedown tests and a final QA inspection. The acceptance test will be in accordance with the following:

a. Key generator functional performance test (7.5.1.4) and test procedures, figure 7-2.

b. Facsimile functional performance test (7.5.2.3) and test procedures, figure 7-3.

7.4.2.1 Acceptance test data and results will be recorded in the space provided in the test procedure sheets, figures 7-2 and 7-3. A copy of the completed sheets will be furnished to the local O&M command to become a part of the permanent facility records.

7.4.2.2 Schedule. The onsite test and acceptance schedule will be determined by the QAR, with concurrence of the project engineer, installation team chief, and the operating agency representative.

7.4.2.3 Test support requirement. One repairman with 32F MOS or equivalent is required from the operating agency to assist on a full-time basis during acceptance testing.

7.5 TEST PLANS. The following tests are designed to verify the key generator, facsimile, and associated equipment perform satisfactorily in accordance with the manufacturer's specifications. Tests will be used as described in the test plan organization section (7.4).

7.5.1 Key generator test. The key generator shakedown test shall be performed after a 24-hour continuous, power-on, burn-in period which has not been interrupted by failure of components or elements inherent to the key generator. The key generator functional performance test shall be conducted after completion of a successful 16-hour, no-failure shakedown test.

7.5.1.1 Reference documents.

a. KAM 237/( )/TSEC (C).

b. KAM 238( )/TSEC (C).

c. KAM 239( )/TSEC (C).

d. KAO-137/TSEC (C).

e. KAM 243/TSEC (C).

7.5.1.2 Test equipment. The following test equipment, or equivalent, is required to complete necessary tests:

a. Oscilloscope, Tektronix 545B.

b. Preamplifier, Tektronix type CA.

c. Differential ac-dc voltmeter, Fluke 803B.

d. Oscilloscope probes 10 to 1, Tektronix P6006. (2 ea)

e. Oscilloscope probe 1 to 1, Tektronix P6027.

f. Data generator (table 1-1, KAM 238B).

g. Plug-in channels (table 1-1, KAM 138B).

h. Power supply 28 Vdc, 16 amps.

i. Element extenders (table 1-4, KAM 237B).

j. Extender cables (table 1-4, KAM 237B).

k. Multimeter AN/PSM-6.

l. Plug-in channels (table 2-1, KAM 238B).

m. Preset counter, HP5331B.

n. Extender cables (table 1-4, KAM 238B).

o. KTK 4000 (Par 2003 KAO-137C/TSEC).

7.5.1.3 Key generator shakedown test. Perform the step-by-step key generator shakedown test procedures (TSEC/KG-34) shown in figure 7-1 and record results in the space provided.

7.5.1.4 Key generator functional performance test. After successful completion of the key generator shakedown test, conduct the step-by-step key generator functional performance test procedures (TSEC/KG-34) shown in figure 7-2 and record the results in the space provided.

7.5.2 Facsimile functional performance test. The facsimile test shall be a functional performance test to verify the key generator, DACOM 412 facsimile, and associated equipment, perform satisfactorily as a system in accordance with the manufacturer's specification. The DACOM 412 facsimile uses the DACOM modem (FXM-40) and automatic data access coupler. The facsimile test shall be performed after successful completion of the key generator functional performance test procedures described in 7.5.1.4.

7.5.2.1 Reference documents. USACEEIA FM 116, Facsimile Test Sheet.

7.5.2.2 Test equipment. A DACOM test set is required for loopback testing of the DACOM 412 facsimile unit. This allows one unit to transmit a document and receive it simultaneously. The USACEEIA FM 116, Facsimile Evaluation Test Sheet with instructions (appendix A addendum 1) is required for this test.

7.5.2.3 Test procedure. After successful completion of the key generator functional performance test, described in 7.5.1.4, conduct the step-by-step facsimile functional performance test procedures shown in figure 7-3 and record the results in the space provided.

USACEEIA
FACSIMILE EVALUATION TEST SHEET

(PRESCRIBING DIRECTIVE: SEIP 034)

(A) SOLID BLACK THE QUICK BROWN FOX JUMPED OVER THE LAZY BLACK DOG'S BACK

(B) 80% BLACK THE QUICK BROWN FOX JUMPED OVER THE LAZY BLACK DOG'S BACK

(C) 60% BLACK THE QUICK BROWN FOX JUMPED OVER THE LAZY BLACK DOG'S BACK

(D)



(E)



(F)



(G)

4 Pt

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0

(H)

6 Pt

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0

8 Pt

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0

10 Pt

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0



(I)

SWITCH SETTINGS:
RESOLUTION (lpi) _____
FILTER _____
REMARKS _____
_____
_____

DATE _____
LOCATION _____
_____
TEST REP _____
(SIGNATURE)

USACEEIA FM 116
16 MARCH 1979

SECTION 8. COMPLETION CERTIFICATION

8.1 GENERAL. The technical acceptance recommendation (TAR) (fig. 8-1), will be prepared by the Test Director for signature by representatives of the participating agencies. It does not consitute official acceptance of the project but does certify that the major items installed and documentation provided are as stated herein. This document further certifies that the project has been installed and performs satisfactorily in accordance with the requirements listed under references except as noted under exceptions and remarks. Upon execution of this TAR, USACEEIA considers this project complete except for such follow-on action as may be necessary to clear the exceptions stated herein.

8.2 INSTRUCTIONS FOR PREPARATION OF TAR.

8.2.1 Entries on the data sheets are to be typed whenever possible to ensure legibility and provide a quality, fully legible product when reproduced. If a typewriter is not available, the forms may be completed by printing with black ink in block letters to ensure legibility. The instructions for completion of this form follow on a block-by-block basis.

8.2.2 Pages are to be sequentially numbered to show both the individual page number and the total number of pages constituting the completed TAR. Additionally, each page will be identified by the date and project/contract number in the appropriate blocks.

8.2.3 Instructions for completion of the TAR are delineated in the following subparagraphs and will be completed in accordance with these instructions.

a. Date. Enter the day, month, and year of completion for this action (e.g., 1/1/79 as the first day of the first month of 1979).

b. Project/contract number. Enter the appropriate project or contract number. If this is a subproject or part of a subproject, provide all necessary information (i.e., IIP milestone number(s), subproject number(s) as well as subdivision(s) to same).

c. Title. Enter the project name or title.

d. Location. Enter the geographic location where the project was installed.

e. Facility. Enter the name of the facility and other pertinent identifying information.

SEIP 034 30 June 1979

TECHNICAL ACCEPTANCE RECOMMENDATION (SUMMARY) (CCCR 702-2)		PAGE 1 OF 6 PAGES
		DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION
FACILITY		TEST DIRECTOR
OPERATING AGENCY		ENGINEERING AGENCY
INSTALLATION AGENCY		TESTING AGENCY

PROJECT DESCRIPTION

This Technical Acceptance Recommendation is executed by the onsite representatives of the installation, test and operating agencies. It does not constitute official acceptance of the project but does certify that the MAJOR ITEMS INSTALLED AND DOCUMENTATION PROVIDED are as stated herein. This document further certifies that the project has been installed and perfoms satisfactorily in accordance with the requirements listed under REFERENCES except as noted under EXCEPTIONS and REMARKS. Upon execution of this TECHNICAL ACCEPTANCE RECOMMANDATION, USACEEIA considers this project complete except for such follow-on action as may be necessary to clear the EXCEPTIONS stated herein.

USACEEIA FM 98-R
1 Jan 79 Replaces HQ USACEEIA CCC-TED-QA FM 98 which is obsolete

Figure 8-1. Technical Acceptance Recommendation.

9. TECHNICAL ACCEPTANCE RECOMMENDATION (INSTALLED EQUIPMENT) (CCCR 702-2)		PAGE 2 OF 6 PAGES DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION
MAJOR EQUIPMENT INSTALLED/RELOCATED		

BOM ITEM NO.	DESCRIPTION	PART NUMBER/FSN	QUANTITY

Figure 8-1. Technical Acceptance Recommendation (Continued).

10. TECHNICAL ACCEPTANCE RECOMMENDATION (DOCUMENTATION) (CCCR 702-2)		PAGE 3 OF 6 PAGES DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION

PROJECT DOCUMENTATION PROVIDED

REFERENCE DOCUMENTATION	TITLE	NO. OF COPIES

Figure 8-1. Technical Acceptance Recommendation (Continued).

11. TECHNICAL ACCEPTANCE RECOMMENDATION (EXCEPTIONS) (CCR 702-2)		PAGE 4 OF 6 PAGES DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION

EXCEPTIONS ENGINEERING ☐ INSTALLATION ☐ OTHER ☐	SUGGESTED ACTION AGENCY

Figure 8-1. Technical Acceptance Recommendation (Continued).

12. TECHNICAL ACCEPTANCE RECOMMENDATIONS (REMARKS) (CCCR 702-2)		PAGE 5 OF 6 PAGES DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION

REMARKS:

Figure 8-1. Technical Acceptance Recommendation (Continued).

TECHNICAL ACCEPTANCE RECOMMENDATION (CERTIFICATION) (CCCR 702-2)		PAGE 6 OF 6 PAGES DATE (DAY, MO, YEAR)
PROJECT/CONTRACT NUMBER	TITLE	LOCATION

CERTIFICATION

Acceptance tests and Quality Assurance Inspections are complete for equipment installed under this project.

WITHOUT EXCEPTIONS ☐ WITH NOTED EXCEPTIONS ☐

INSTALLATION AGENCY	SIGNATURE AND TITLE PRINTED
OPERATING AGENCY	SIGNATURE AND TITLE PRINTED
TEST AGENCY	SIGNATURE AND TITLE PRINTED

ACCEPTANCE

Equipment herein certified successfully installed and tested, is accepted for operation.

OPERATING COMMAND	SIGNATURE TITLE

Figure 8-1. Technical Acceptance Recommendation (Continued).

f. Test Director. Enter the name, title, and grade of the Test Director or QAR assigned to this project.

g. Operating agency. Enter the name, symbol, and complete mailing address of the organization having O&M responsibility for this project, system, or equipment installation.

h. Engineering agency. Enter the name, symbol, and complete mailing address of the organization having engineering cognizance and responsibility.

i. Installation agency. Enter the name, symbol, and complete mailing address of the organization having been tasked to install the TAR material.

j. Testing agency. Enter the name, symbol, and complete mailing address of the QA and testing organization tasked for this project.

k. Project description. Enter a brief and concise description of the project to which the TAR applies.

l. Major equipment installed/relocated. List the major items of equipment installed or relocated in accordance with the project requirements. Enter the BOM line number, material description, assigned part number or federal stock number, and the quantity of each major item. Components, assemblies, and subassemblies configured into a major item as listed in SB 700-20 or CCP 700-20 should also be recorded. Additional pages, numbered in sequence, may be added as required.

m. Documentation. Enter the document identification (i.e., drawing number, technical manual number, etc.), title, and the quantity of each document provided to the operating unit as part of the project.

n. Exceptions.

(1) Upon completion of installation and testing, any exceptions to the project requirements which require corrective action will be listed. Include complete identification of each missing item. Exceptions must be based on the specified requirements of the project, supportable through the test results or other valid documentation, fully described, and precisely identified.

(2) The appropriate exception block must be annotated and separate sheets should be used for each category of exception.

(3) The Test Director will also enter the suggested action agency for each exception, recognizing the Test Director may not always be in a position to determine the final action agency.

(4) For facilities that are becoming partially operational, identify installation agency actions remaining for project completion. In this situation, the TAR will show the tests that have been made, but will be identified as a partial record. A final TAR will be prepared after installation and testing of all remaining project equipment.

o. Remarks. The remarks section may be used to provide any additional information on or in support of a recommendation, commendation, or criticism in relation to the project installation, engineering, or testing. Entries may include:

(1) Shortcomings which do not require corrective action (not considered an exception).

(2) Recommendations for improving projects of a similar nature.

(3) Identification of support items that have not been accomplished, and a description of any activity in progress by the operating agency to satisfy the requirement.

(4) A description of test results with the performing agency and date(s) accomplished.

(5) A statement to the effect that the installation agency will forward final "as built" drawings when completed.

(6) A description of the ac power system with identification of source and backup capability.

(7) A statement to indicate a list of excess material was provided the operating command for final disposition or to identify material that was excess to the project.

p. Certification. Enter the signatures and certification that the project was installed, tested, and accepted for operation with or without exceptions as applicable. The certifications contained in or prescribed by this publication are essential to the conduct of the Government's business.

APPENDIX A

DACOM 412A OPERATING PROCEDURES

1.0 AUTOMATIC OPERATION. The operation of the DACOM 412 is basically the same as other 400 Series terminals. Use the telephone associated with the data access arrangement (normally a CBT data coupler) to dial other terminals and to carry on voice coordination.

1.1 Transmit sequence.

1.1.1 Select the variables appropriate to the material to be transmitted:

a. Paper length--5-1/2" or 11" or 14".

b. Transmit mode--"QUALITY" for 100 lpi resolution; "FINE DETAIL" for 200 lpi resolution; "EXPRESS" for 67 lpi resolution.

c. MULTIPAGE--if several documents are to be sent during the same call.

d. FILTER--if the telephone connection is expected to be poor.

e. SECURE or CLEAR--for encrypted or not encrypted (this switch is inside the front service door).

1.1.2 Insert the document into the scanner. If the FAIL RESET light flashes, remove the document, press the RESET switch, and try again.

1.1.3 When the READY light goes out and FAIL RESET is not blinking, go to the telephone associated with the CBT data coupler.

1.1.4 Lift the handset and place the exclusion key in the "UP" position. This connects the line to the telephone.

1.1.5 Dial the remote terminal in a normal manner.

1.1.6 When the answerback warble is heard, replace the handset on the receiver. This will put the exclusion key in the "DOWN" position and transfer the line from the telephone to the 412 for automatic operation. Also, the action of placing the handset on-hook will be relayed through the Faxmodem (FXM-40) to the 412 which will generate a signal equivalent to pressing the SEND switch.

1.1.7 The document transmission will take place automatically.

1.1.8 If the automatic handshake is not successful, or if the document transmission fails, the FAIL RESET indicator will turn on and the document will be ejected. In this case, the condition of the telephone lines is suspect. Select the FILTER mode and reapply the TRANSMIT sequence.

1.1.9 When each document transmission is taking place, it is possible to select new variables appropriate to the next page. MULTIPAGE may be selected during the first document transmission, if several pages are to be transmitted during the same call. FILTER is the only variable that cannot be changed during a transmission. In MULTIPAGE, the next document must be loaded into the scanner after the previous page has left the scanner and the READY light comes on, but not longer than 10 seconds after the READY light comes on.

1.2 Receive sequence.

1.2.1 Receiving a document is an automatic operation. Normally, no operator intervention is required. The received copy tone will be heard when the copy is delivered to the receive tray and the RECEIVE light will blink until the copy is removed from the tray.

1.2.2 If a printer jam occurs, a 250 Hz tone will be heard for 3 seconds and the PAPER light will blink continuously until the jam is cleared.

2.0 VOICE COORDINATION MODE. The voice coordination mode is used for the originating terminal operator to talk to the answering terminal operator. The voice coordination can be initiated only by the originating terminal. To enter the voice coordination mode, go to the telephone at the CBT data coupler, lift the handset and place the exclusion key in the "UP" position. Dial the remote terminal in a normal manner. After the called terminal has answered, a short answerback warble will be heard. This interrupted tone will continue for a maximum of 30 seconds. After 7 seconds, however, the voice coordination buzzer will ring at the answering terminal to summon the operator. The called terminal operator responds by going to the telephone at the CBT data coupler, lifting the handset and placing the exclusion key in the "UP" position. The voice conversation then can take place. If 30 seconds elapse (23 seconds from start of buzzer) before the telphone handset is lifted at the answering terminal, it will hang up automatically. During the voice conversations, it will

be necessary to decide which terminal will transmit and which will receive, and if voice conversation is needed after the document transmission. The following steps then must be taken:

2.1 Transmit mode.

2.1.1 Select the variables appropriate to the material to be transmitted in accordance with 1.1.1 above.

2.1.2 Insert the document into the scanner.

2.1.3 Tell the remote terminal to press the RECEIVE switch.

2.1.4 When the answerback warble is heard, replace the handset on the receiver.

2.1.5 The document transmission will take place automatically.

2.1.6 If you want to talk after the document transmission, pack up the handset before the end of the transmission. It needs to be left on-hook only a second or two to start the transmission.

2.1.7 If you do not want to talk after the document transmission, leave the handset on-hook.

2.2 Receive mode.

2.2.1 When the remote terminal operator tells you to press RECEIVE, first put the exclusion key in the "DOWN" position. Do not put it all the way down and do not hang up the handset.

2.2.2 Then go to the facsimile terminal and press the RECEIVE button. The document transmission will take place automatically.

2.2.3 If you want to talk after the document transmission, leave the handset off-hook.

2.2.4 If you do not want to talk after the document transmission, go back to the CBT telephone and hang up the handset.

2.3 To talk after a document transmission. The voice coordination mode can be initiated only by the originating terminal operator as described above. During the voice conversation, it is necessary to agree on whether or not to talk after the document transmission. If it is agreed to talk, then both handsets must be off-hook at the end of the transmission.

When the voice coordination buzzer signals the end of transmission, press the STOP switch to silence the buzzer, go to the CBT telephone and put the exclusion key in the "UP" position. You will be able to continue the voice conversation. If you do not press the STOP button to silence the buzzer, it will stop automatically after 30 seconds. However, you will not be able to start another document transmission until the handset has been placed on-hook. This will disconnect the telephone line and it will be necessary to dial again to reestablish the connection before further transmission can take place.

APPENDIX A, ADDENDUM 1

DACOM 412 CONTROLS AND INDICATORS

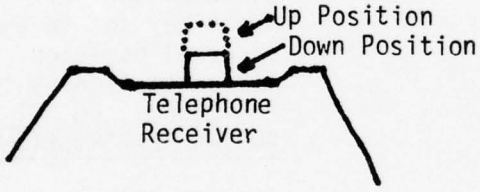
1. DOCUMENT POSITIONER AND SCANNER SLOT:	Adjusts to document size.
2. PAPER SIZE SELECTOR BUTTONS:	(a) 5-1/2 inches. (b) 11 inches. (c) 14 inches.
3. "RECEIVE" INDICATOR:	Light on - machine in receive mode. Blinking light - paper in receive tray.
4. "PAPER" INDICATOR:	Light on - high voltage or paper out. Blinking light - paper jam.
5. "E-MIX" INDICATOR:	Light on - toner low.
6. "READY" INDICATOR:	Light on - paper may be inserted into scanner. Always be sure light is on first.
7. SENT COPY PORT:	Holds copy after it passes through scanner.
8. "TRANSMIT" INDICATOR:	Light on - transmit mode.
9. "FAIL" INDICATOR:	Light on - document transmission failure. Blinking light - possible improper paper feed into scanner. If not the problem, call for service.
10. "RESET" BUTTON:	Resets system after scanner or transmission failure.

11. SCAN RESOLUTION SELECTOR BUTTONS:	"EXPRESS" - (67 lpi) - Bold print. "QUALITY" - (100 lpi) - Normal print. "FINE DETAIL" - (200 lpi) Small or faint print.
12. "MULTIPAGE" BUTTON:	For continuous (within 8 seconds) transmission.
13. "FILTER" BUTTON (SEND RATE):	The 412 is normally in a 4800 b/s rate. In case the telephone line is bad, press the "FILTER" button (light will come on) to decrease the transmission rate (2400 b/s) over the telephone line and increase the copy quality. Keep the Modem key set in the external position. The 412 automatically controls the Modem. DO NOT SWITCH DURING TRANSMISSION
14. "STOP" BUTTON:	Stops transmit or receive mode and stops voice coordination buzzer.
15. "RECEIVE" BUTTON:	Places 412 in receive mode after voice coordination
16. RECEIVED COPY PORT:	Holds received copy.
17. "PAPER CYCLE" TEST BUTTON:	Starts a paper cycle for test operation.
18. "LAMP TEST" BUTTON:	Applies voltage to all indicator lamps for test.
19. "ON/OFF" SWITCH:	Primary ac power switch.
20. "COPY COUNT":	Accumulates count of document transmission.
21. PAPER DOCK AND FEED:	(See maintenance documents for instructions).

22. "SECURE" or "CLEAR" SWITCH: Selects clear or encrypted mode. Must be set the same as the GFE mode.

23. DAA AND ASSOCIATED TELEPHONE: The telephone instrument used with the 412 is associated with the data access arrangement. The DAA provides automatic reception and operation of the telephone line and prevents the 412 from inserting harmful voltage into the telephone line.

24. EXCLUSION KEY: One of the disconnect buttons on the telephone receiver is colored white. This is the exclusion key. The exclusion key switches the 412 from a data mode to a voice mode. UP is for voice, and DOWN is for data.



30 June 1979 SEIP 034

(CC-OPS)

FOR THE COMMANDER:

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Chief of Staff

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LTC, AGC
Adjutant General

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10 - CCC-CED-SEP
4 - CCC-CED-SW
4 - CCC-TED
5 - USACEI Bn
10 - USACEEIA-CONUS, ATTN: CCCN-TR, Fort Ritchie, MD 21719
10 - USACEEIA-EUR, APO New York 09056
10 - US Army Signal School, ATTN: ATSN-CD-MS, Fort Gordon, GA 31905
2 - US Army Materiel Development and Readiness Command, ATTN: CCN-PI-P, Washington, DC 20315
5 - 5th Signal Command, APO New York 09056
5 - 7th Signal Command, Fort Ritchie, MD 21719
1 - US Army Communications Command, ATTN: CC-OPS-PT, Fort Huachuca, AZ 85613
2 - US Army Training and Doctrine Command, ATTN: ATCE, Fort Monroe, VA 23351
2 - US Army Forces Command, ATTN: AFCE, Fort McPherson, GA 30330
2 - Defense Communications Agency, Technical Library Center, Code 205, Washington, DC 20305
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2 - US Air Force, ATTN: USAFSAAS/TEOOA, Keesler AFB, MS 39534
2 - 1842 EEG/EEISD, Scott AFB, Il 62225
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