TYPE O AND ON CARRIER TELEPHONE SYSTEMS
TERMINALS AND JUNCTIONS
PRELIMINARY TESTS
PREPARATION AND PLACEMENT OF TERMINAL UNITS

This section is reissued to update equipment designations and to clarify the procedures. Since this reissue includes a general revision, arrows ordinarily used to indicate changes have been omitted.

The purpose of this section is to provide the necessary procedures for properly preparing a complete terminal group for service.

APPARATUS:

1 — KS-14510, L1, Volt-Ohm-Milliammeter (VOM), or equivalent
1 — 136B or 508A Relay Blocking Tool
1 — Blown Fuse

STEP	PROCEDURE

A. Preliminary Information for O Carrier Installations

For OB, OC, or OD terminals the strapping of the terminals of the 200J, 200S, or 200T network which is mounted on the line transformer and network panel depends upon the combination of O systems that are connected to the carrier line pair. For other than the first of the OB, OC, or OD systems on the pair, the connections to the line are made by multipling the terminal to an existing terminal. The networks to be used and the strapping required when the terminal is multipled to the line are shown in Table A. The existing terminal need not be taken out of service except for the short time necessary to change the networks if required, or to change the strapping on the network and connect the terminal to the existing terminal. For OA terminals there are no networks to be strapped; they may be tested entirely independent of the OB, OC, or OD terminals.

TABLE A

TYPE O SYSTEM MULTIPLED ON OPEN WIRE PAIR	NETWORK USED	STRAP TERMINAL
OB only	200J or 200T	1-3-5 and 2-4-6
OB and OC	200J	1-5 and 2-6
OB and OC and OD	200J or 200T	no straps
OC only	200S	1-5 and 2-6
OD only	200S or	1-3 and 2-4
	200T	1-3-5 and 2-4-6
OC and OD	200S	no straps
OB and OD	200T	1-3-5 and 2-4-6

STEP	PROCEDURE
	B. Preliminary Information for ON Carrier Installation
	In ON carrier, the level control oscillator should be used when the system is partially equipped. In such cases, the oscillator should be inserted into the jack on the combining network and oscillator panel when terminal groups are being assembled. Regardless of the number of terminal groups initially installed, the power connections for the oscillator should be made to provide for possible future changes.
	C. Use of Attached Figures
	This section, in addition to providing step-by-step procedures for preparing a terminal group for service, provides detailed figures keyed to the procedures. Fig. 1 illustrates a complete O carrier high-group transmitting (HGT) terminal. Fig. 2 illustrates a complete O carrier low-group transmitting terminal. Fig. 3 illustrates an ON terminal group. The following example is used to demonstrate the use of the figures.
	Example: Step 7 states that the GRP OSC unit be placed in the position indicated on the figures and that straps be cut in accordance with the figures. This procedure is illustrated in the figures and keyed (⑦) back to the procedural step. As shown in Fig. 1 for O carrier, it is necessary to cut the straps between terminals 1 and 2 and between terminals 3 and 4 when an HGT terminal is being prepared. Fig. 3 shows, for ON1, that it is necessary to cut the straps between terminals 1 and 2 and 1 and 4 for groups 1, 3, and 5. For groups 2 and 4 the straps between terminals 2 and 3 and between 3 and 4 should be cut.
	D. Tests and Procedures
1	Check that terminals 17 and 18 of terminal strip are strapped together as follows:
	O carrier: strapped together on OA and OB terminals and not strapped for OC or OD terminals.
	ON carrier: strapped together for groups 4 and 5 of ON1 or for groups 4, 5, and 6 for ON2 and not strapped for groups 1, 2, and 3. Check that strapping between terminals 57 and 59 and between 58 and 60 is removed.
2	Remove strap across R23 in fuse panel if only 1 or 2 channel units are used and the average 48V battery voltage is 47 volts or higher.
3	Block the CA relay nonoperated with the 136B or 508A tool and remove the 313C tube V31. This procedure prevents the terminal 48V supply fuse from being blown during certain signaling testing conditions which are specified for line-up tests. (Blocking the relay prevents 48V battery from being applied to the E and M leads of channel 1, which would normally occur during an alarm condition.) The 313C tube is removed to prevent damage to it which would be caused by blocking the CA relay nonoperated for long periods when there are no received carriers.
4	Remove fuses from fuse panel and place the fuse panel part way into the position as indicated in the figures.
5	Connect the power plug to the receptacle and finish sliding the fuse panel into position. Be sure the cord is free from adjacent wires when the unit is being inserted.
	Caution: Some of the plug-in units are equipped with shields. These shields are provided in order to minimize crosstalk, damage to the components, or danger to personnel working around the units. It is important that the shields be replaced properly whenever they have been removed for any reason.

STEP	PROCEDURE
6	Place two twin channel units in positions indicated in the figures. In O carrier, note the 192KC and 184KC markings on the figures. If the terminal connects through open wire line to a type ON junction, use twin channel units bearing List No. 3, 7, 12, or 21 and 4, 8, 13, or 22.
7	Place the proper GRP OSC unit in the position indicated in the figures with straps cut on TB1 as shown. Table B gives frequencies for the O carrier system. Frequencies for the ON system are on Fig. 3.

TABLE B

TYPE O TERMINAL	FREQ (KC)		GRP OSC LIST NO.
	CARR L OSC	CARR H OSC	
OA	198	216	L2
OB	236	256	L1
OC	276	296	L3
OD	316	336	L4

8 Before placing the group transmitting unit in position:

(a) Strap for X and Y wiring.

(b) Check that a 408A tube (***not*** a 393A plug) is in socket V1. Otherwise, excess voltage will be applied to the heater of the 408A tube in socket V2.

(c) For ON carrier set the NOISE potentiometer fully counterclockwise.

(d) For OA terminals, remove the side shield and cut strap as shown on drawing. Replace side shield.

9 Place the GRP REC unit in position indicated in the figures. Table C gives proper filters in an O system. For an OA terminal, cut the strap on TB1 as shown. Fig. 3 gives proper filter locations for an ON system.

TABLE C

TYPE O TERMINAL	FILTER USED IN TOP POSITION	FILTER USED IN BACK POSITION	
		HGT	LGT
OA	530H	530J	531F
OB	530A	531B or 530P	531C or 530R
OC	530B	530C	530D
OD	530E	530F	530G

<table>
<tr><th>STEP</th><th>PROCEDURE</th></tr>
<tr><td>10</td><td>Place four channel units in positions indicated with 529D and 529E filters located and oriented as shown in the figures. The following choices need to be considered.

(a) 2-wire and 4-wire terminating arrangements (if available): The 4-wire terminating sets which are built into the channel units permit the channels to be operated either 2-wire or 4-wire. The connections for 2-wire and 4-wire operation are indicated in Fig. 4. The connections may be made prior to system line-up, if desired, but it is less complicated to make the tests on a 4-wire basis. The units are wired at the factory for 4-wire operation. The overall channel net gain adjustment should be made with the specified wiring.

(b) Signaling (if equipped): When the built-in signaling facility is not to be used, the 3700-cycle signaling tone should be disabled as covered on the standard drawings. This is done at the intermediate distributing frame or at the VF channel patching bay by connecting the B lead (battery) to the M lead of the channel using external signaling arrangements.

(c) Signaling link-jack and lamp circuit: J98705AF thru-channel units may be used when type O and ON carrier channels are used in tandem with other O, ON, or N carrier channels. The thru-channel units provide for signaling as well as message interconnection. When the thru channel is not furnished, the signaling circuits may be interconnected by means of a J98705P signal link panel. For such a connection a dummy plug is required in the associated jack. For the signaling tests on the individual links of the circuit, the dummy plug must be removed except when a J98705M channel unit test stand is used.</td></tr>
<tr><td>11</td><td>Set the HTR potentiometer fully clockwise.</td></tr>
<tr><td>12</td><td>Using the VOM, measure the resistance between the GRD jack and the innermost terminal of each fuse mounting. Keep the meter on the 300V voltmeter scale until the test lead is in firm contact with the fuse mounting terminal.

<table>
<tr><th rowspan="2">FUSE BLOCKS</th><th colspan="2">MINIMUM RESISTANCE</th></tr>
<tr><th>WITH R23 STRAPPED OUT</th><th>WITH R23 STRAPPED IN</th></tr>
<tr><td>−48V, 3A
−48V, 2A
+130V, 2A</td><td>3.3 ohms
400 ohms
1000 ohms</td><td>10.0 ohms
400 ohms
1000 ohms</td></tr>
</table></td></tr>
<tr><td>13</td><td>Set the HTR potentiometer fully counterclockwise.</td></tr>
<tr><td>14</td><td>In ON carrier, insert the level control oscillator into the jack on the combining network and oscillator circuit panel when required. (Not illustrated in the figures.)</td></tr>
<tr><td>15</td><td>Check the fuse alarm by inserting a blown fuse in each fuse holder and make sure the alarm lamp lights (48V for 48-volt fuse and CARR 3700 for 130-volt fuse). Insert good fuses after the check is completed.</td></tr>
<tr><td>16</td><td>Adjust HTR potentiometer to obtain proper heater voltage as measured between −40V and GRD jacks (see Section 362-110-501).</td></tr>
<tr><td>17</td><td>Fasten coverplate in position by means of quick-acting fasteners. This may be done after placement or line-up tests have been completed.</td></tr>
</table>

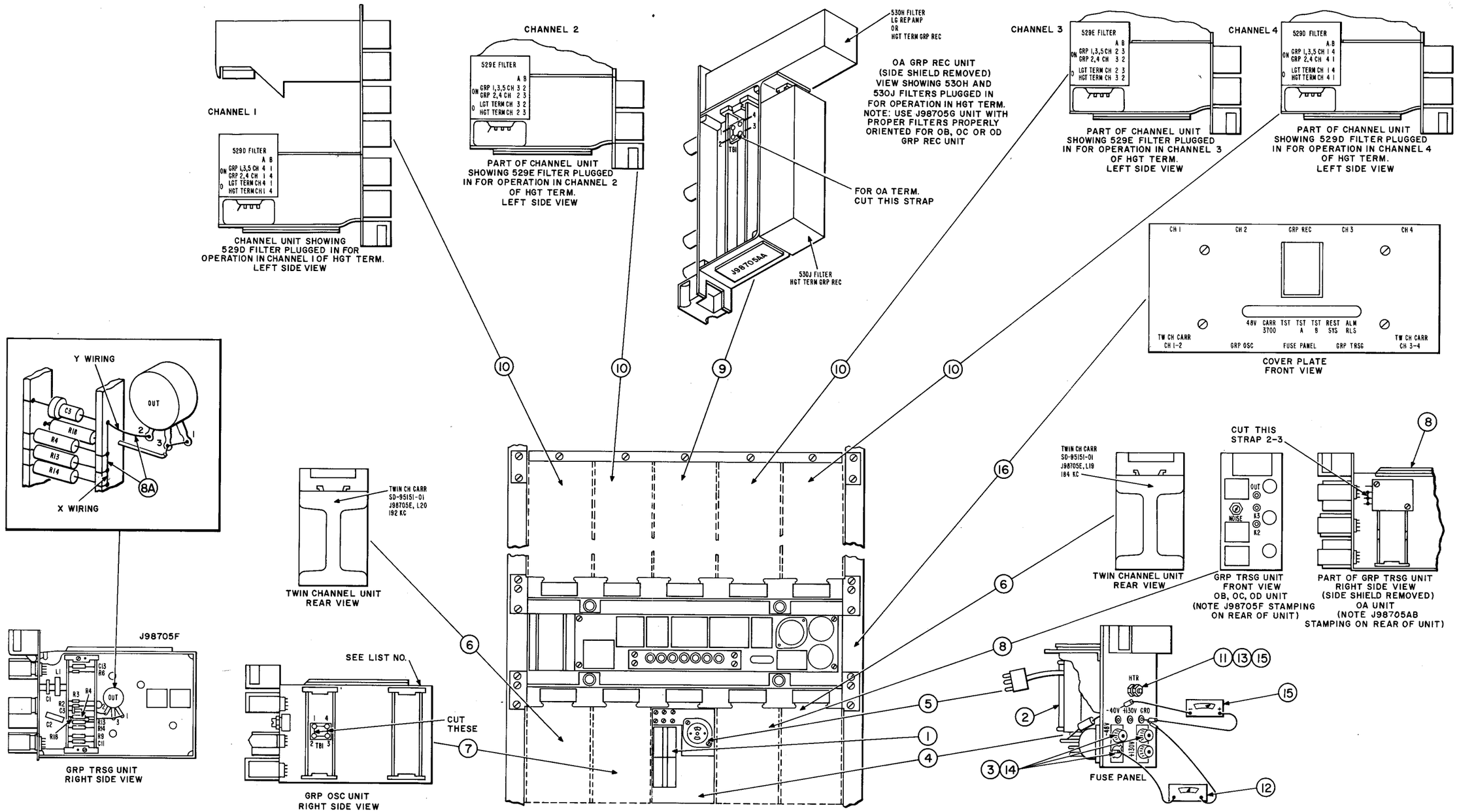


Fig. 1 — Preparation of HGT Terminal

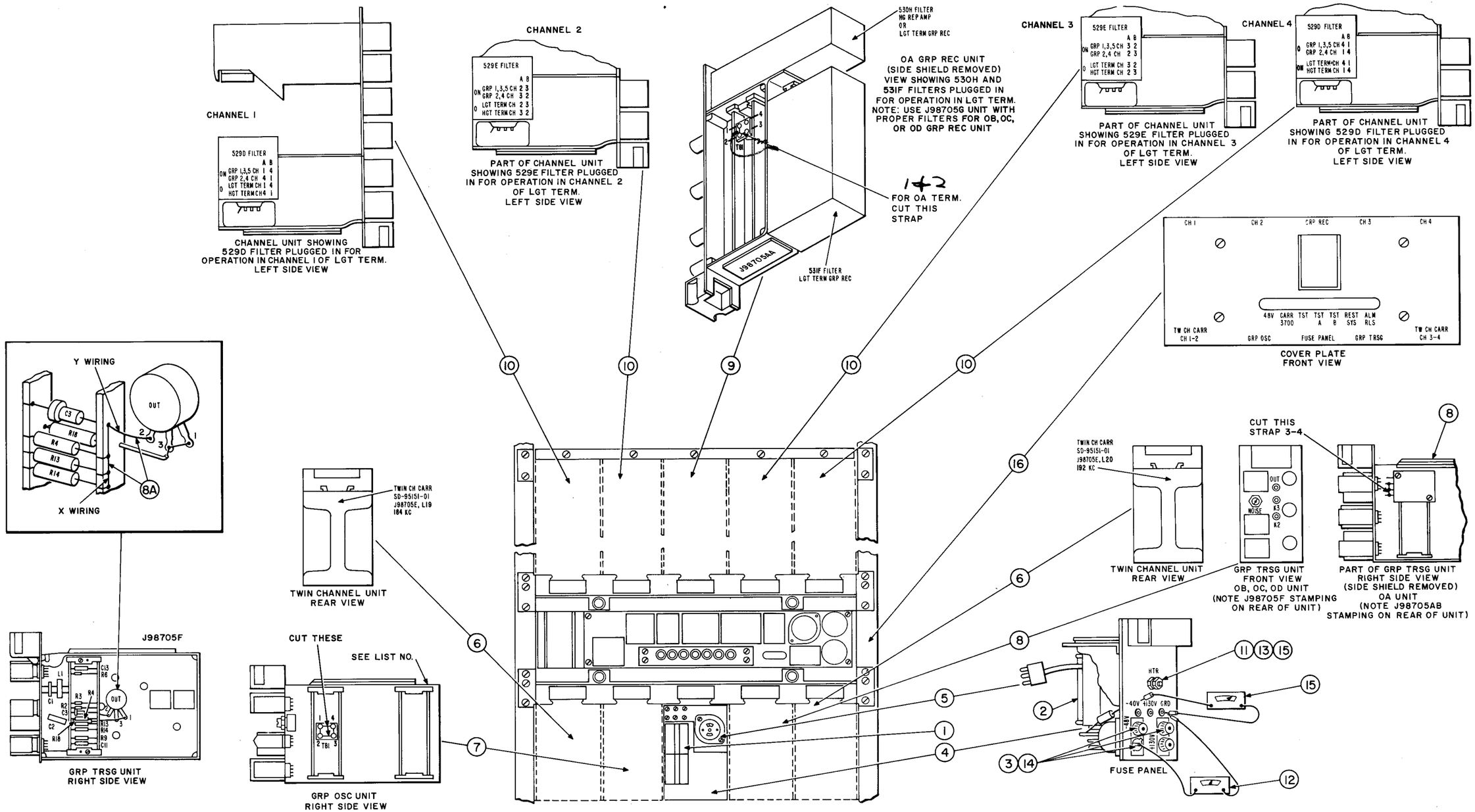
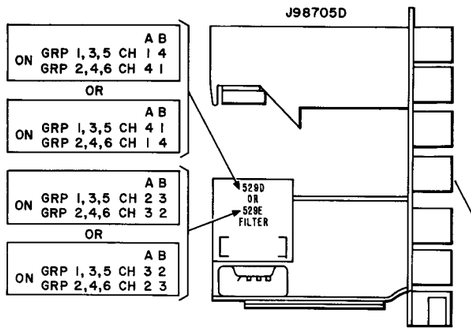
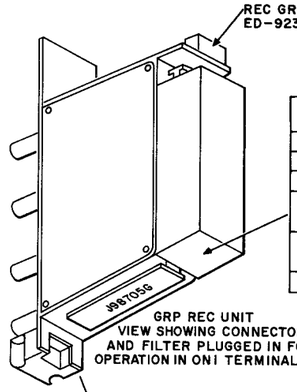


Fig. 2 — Preparation of LGT Terminal

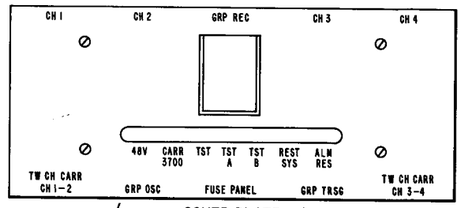


LEFT SIDE VIEW OF CHANNEL UNIT
ORIENT AND PLUG IN 529 FILTER SO DESIGNATION SHOWS AS IN TABLE FOR THE CHANNEL AND CHANNEL ORDER CALLED FOR



GRP REC UNIT
VIEW SHOWING CONNECTOR AND FILTER PLUGGED IN FOR OPERATION IN ON1 TERMINAL GROUP

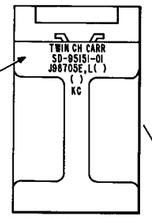
GROUP NO.	ON1 FILTER DESIGNATION	ON2 FILTER DESIGNATION
1	530F	530AF
2	530D	530D
3	530C	530AE
4	531C OR 530R	530AD
5	531B OR 530P	530AC
6	–	530AB



COVER PLATE
FRONT VIEW

TWIN CH UNIT FOR CHS 1 & 2

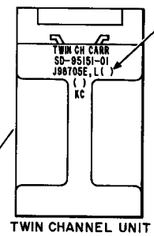
CHANNEL ORDER	GRPS 1, 3, 5	GRPS 2,4,6
A	LIST 3,7,12,21 (184 KC)	LIST 4,8,13,22 (192 KC)
B	LIST 4,8,13,22 (192 KC)	LIST 3,7,12,21 (184 KC)



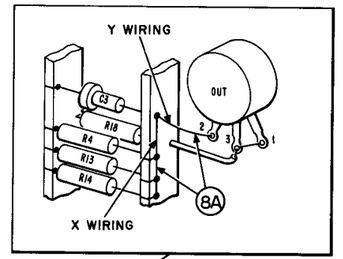
TWIN CHANNEL UNIT
REAR VIEW

TWIN CH UNIT FOR CHS 3 & 4

CHANNEL ORDER	GRPS 1, 3, 5	GRPS 2, 4, 6
A	LIST 4,8,13,22 (192 KC)	LIST 3,7,12,21 (184 KC)
B	LIST 3,7,12,21 (184 KC)	LIST 4,8,13,22 (192 KC)

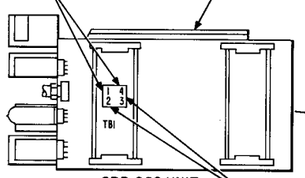


TWIN CHANNEL UNIT
REAR VIEW



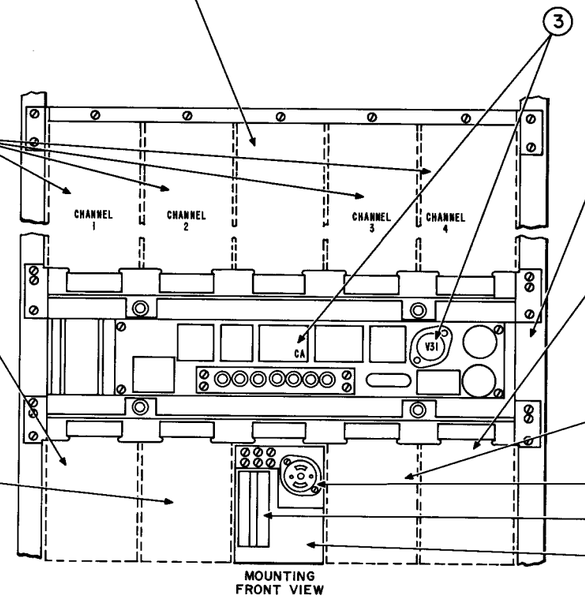
TYPE SYSTEM	GROUP NUMBER	J98705H LIST NUMBER	FREQ-KC CARR L OSC	FREQ-KC CARR H OSC
ON1	1	L4	316	336
	2,3	L3,L5	276	296
	4,5	L1	236	256
ON2	1,2	L3,L5	296	312
	3,4	L6	264	280
	5,6	L8	232	248

CUT THESE FOR GRPS 1,3 & 5-ON1
2,4 & 6-ON2 (NOTE 1)

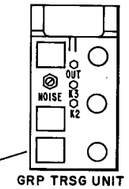


GRP OSC UNIT
RIGHT SIDE VIEW

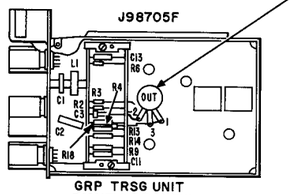
CUT THESE FOR GRPS 2 & 4-ON1
1,3, & 5-ON2 (NOTE 2)



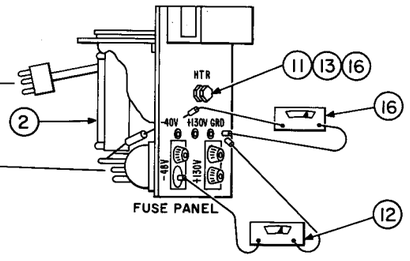
MOUNTING
FRONT VIEW



GRP TRSG UNIT
FRONT VIEW



GRP TRSG UNIT
RIGHT SIDE VIEW



FUSE PANEL

NOTES:
1. IF LIST 3 OSCILLATOR IS BEING USED FOR ON 2 GRP. 2, CUT STRAPS AS INDICATED FOR ON 1 GRP 2.
2. IF LIST 5 OSCILLATOR IS USED FOR ON 1 GRP 2, CUT STRAPS AS INDICATED FOR ON 2 GRP 2.

Fig. 3 — Preparation of ON Terminal Group

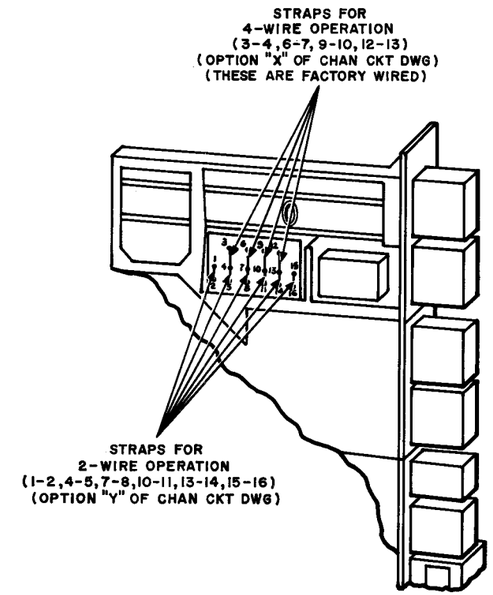


Fig. 4 — Connections for 2-Wire or 4-Wire Operation