TANDEM PATCHING BAY
FOR SPARE EQUIPMENTS AND PATCHING TRUNKS
FOR 4-WIRE AND 6-WIRE VF CIRCUITS

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1. GENERAL

1.01 This section describes the J68896 tandem patching bay (TPB) and associated spare equipment used with voice-frequency circuits.

1.02 The TPB provides the necessary patching trunks and spare equipment jacks required to patch out defective equipment and restore service with working equipment (see Fig. 1). It is also used to interconnect transmission facilities, to establish circuits on a patch-order basis to meet temporary traffic demands, and to provide access to spare equipment for use in the operating center area.

1.03 The TPB provides a means of substituting, by means of patch cords, spare equipment units or complete spare equipment packages for defective units or circuits. It also provides a common patching point for more efficient maintenance operations. Another feature of the TPB is its design for use with office equipment arrangements where direct wiring is used.

2. CIRCUIT TYPES

2.01 The jack circuits of the TPB are classified as spare consolidated equipment, spare consolidated equipment with access, spare individual equipment units, and patching trunks. Standard arrangements and typical uses of these jack circuits are shown in block diagram form in Fig. 2 through 22.

2.02 Table B, preceeding Fig. 2, is a block diagram index which may be used to locate a particular circuit block diagram. Functional schematic (FS) numbers shown on the block diagrams refer to functional schematics found on SD-5G095-01. Notes referenced on the block diagrams are as shown on Table B.

A. Spare Consolidated Equipment

2.03 A spare consolidated equipment (SCE) circuit consists of all the office equipment necessary to link a transmission channel to the trunk circuits. It provides jack access to the line side of complete voice-frequency circuits which may include such items as signaling units, echo suppressors, equalizers, and level adjusting pads. The voice-frequency circuits are constructed to correspond to the most prevalent circuit configurations in use in the office and are permanently interconnected. Once an SCE circuit has been established it is restricted to replacing working circuits of exactly the same make-up.

2.04 Figures 2 through 7 illustrate standard arrangements of the SCE circuit as applied to various transmission channels. These circuits appear at the TPB as either 2- or 3-jack circuits. The 2-jack circuit appears when SF signaling is used and the 3-jack circuit appears when built-in signaling is employed.

B. Spare Consolidated Equipment with Access

2.05 The spare consolidated equipment with access (SCEWA) circuits supplement the SCE circuits

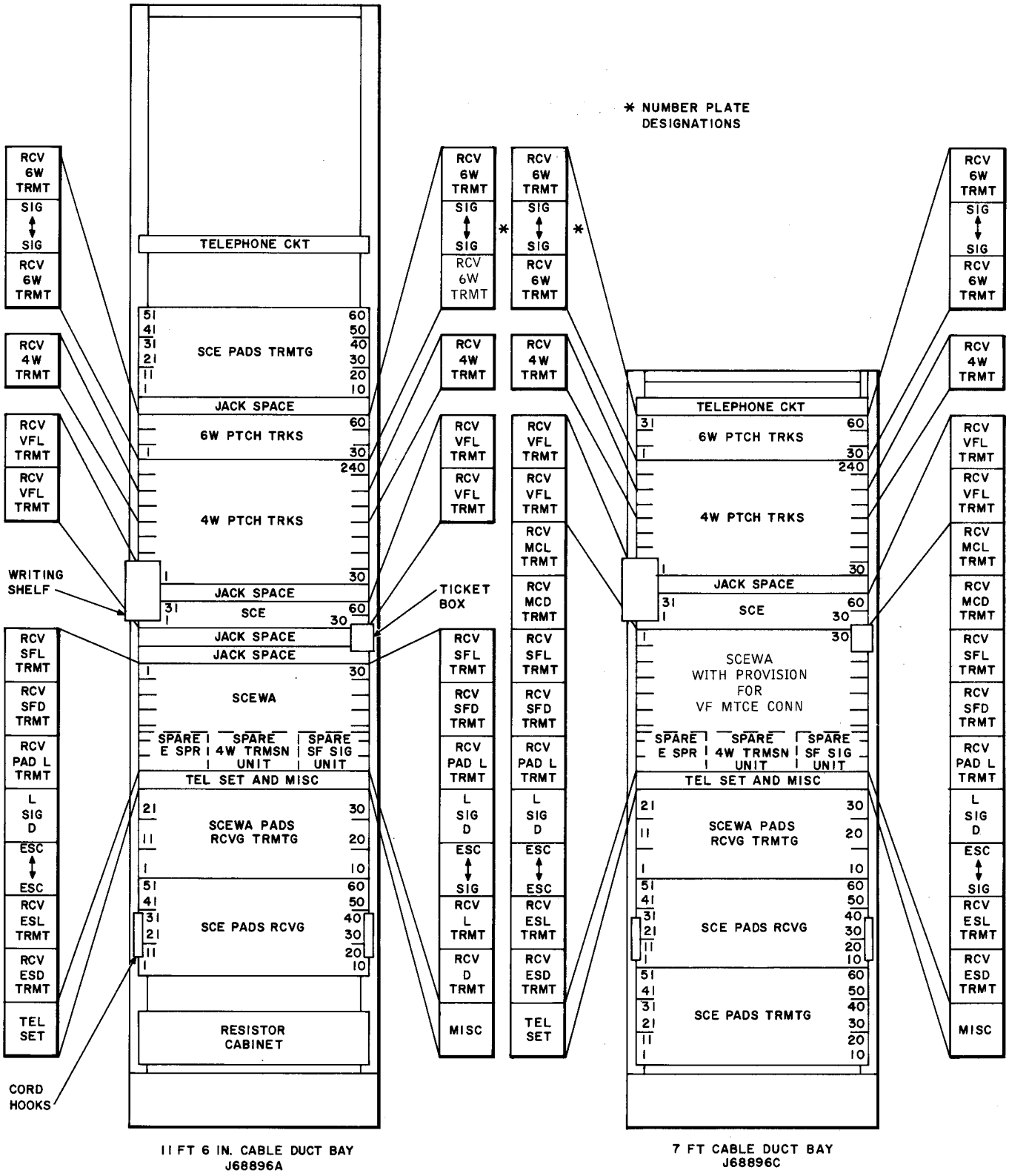

Fig. 1—Typical Fully-Equipped Tandem Patching Bays

in providing spare circuits. A SCEWA circuit consists of an SF signaling unit and pads, with jack access provided between the SF unit and the pads, in addition to jack access at the line side of the SF unit. This access permits substitution of SF signaling units of different types, insertion of additional VF equipment, and makes the jack access provided between the SF unit and the pads associated with the SCEWA circuit available for direct patching to transmission facilities.

2.06 The SCEWA circuit, when properly patched at the TPB, is capable of providing a variety of the less prevalent spare circuits, as shown in Fig. 8 through 22, by permitting the insertion of any of a number of other spare individual equipment units. Figures 8 through 10 illustrate standard arrangements of the SCEWA circuits and Fig. 11 through 22 illustrate typical patched uses of the circuit.

2.07 A voice-frequency maintenance connector (VFMC) may be provided as part of the SCEWA circuit. When employed, this connector and the SF signaling unit and pads are mounted in a consolidated bay. The consolidated bay is arranged so that direct terminal access to the drop (office) side of the VFMC is not available. However, access is gained through the use of a through channel connector and pad circuit (J99272CA) which is equipped with zero-loss pads. This circuit provides continuity through the SF signaling unit connector and allows the output at the drop (office) side of the VFMC to appear at the terminals otherwise assigned to the signaling unit.

C. Spare Individual Equipment Units

2.08 Spare individual equipment units may include echo suppressors, SF signaling units, and other 4-wire transmission equipment such as equalizers and amplifiers which are provided with jack appearances at the TPB on both the line and drop (office) sides. These units may be used to vary the make-up of the SCEWA circuits to provide spare circuits required to replace or expand the less common working circuit configurations in an office.

2.09 The spare echo suppressors have a 4-jack appearance at the TPB. When echo suppressor control is required an optional echo suppressor control (ESC) jack is included. Each echo suppressor, terminated at the TPB, is dedicated for use as a spare. Typical applications of the echo suppressor are shown in Fig. 12 through 14, 16 through 18, and 20 through 22.

2.10 Each spare SF signaling unit has a 5-jack appearance at the TPB. This allows spare SF signaling units of either like or different type to be substituted for the SF signaling unit which is part of a normal SCEWA circuit. Figures 8, 9, 10, 13, 14, 17, 18, 21, and 22 show typical uses of the SF signaling unit as used in SCEWA circuits.

2.11 The 4-wire transmission equipment, such as repeaters and equalizers, has 4 jack appearances at the TPB. Examples of this equipment, used in SCEWA circuits, are shown in Fig. 12, 13, 14, 16, 17, 18, 20, 21, and 22.

D. Patching Trunks

2.12 Patching trunks are provided to connect the TPB to VF patching bays, other transmission facility patching fields, or other areas in an office. The patching trunks may be either 6-wire or 4-wire. The 6-wire is used when built-in signaling is provided and the 4-wire is used when built-in signaling is not used.

2.13 Most of the patching trunks are used to connect the TPB to transmission facility access patching points at the voice-frequency patching bay. The remaining trunks may be used to gain access to other patching locations in the office, such as repeater bays, the telegraph service center, the program room or the private line operating center. These trunks allow the spare equipment circuits to be patched to appropriate facilities, permit the interconnection of transmission facilities, and make the transmission facilities available to the locations listed above.

E. Telephone Circuits

2.14 The TPB has a provision for 2-wire telephone circuits which are used to communicate with other points in the building. The telephone circuit occupies the space of one 1-3/4 by 23-inch mounting plate and contains keys, jacks, and lamps.

2.15 Two options are provided to allow use of the telephone with either the universal tie line or tie trunk circuit (SD-99434-01) or other types of talking trunks such as the 2-way automatic trunk circuit (SD-68097-01). Provision for the

appearance of four of these trunks is supplied at a jack mounting in the TPB. These appearances consist of a key and lamp for each universal tie line or a jack and lamp for each other type of talking trunk, in which case two additional jacks are required: one labeled TEL 2W and another which is a dummy jack to hold one end of the patching cord when not in use. In the former case, one of the four trunks is selected by turning the appropriate key and, in the latter case, by patching between the TEL 2W jack and the appropriate trunk jack. A pair of jacks labeled TEL are provided at the extreme left of the jack mounting for connection of the attendant headset.

3. APPLICATION

3.01 The TPB facilities are provided for offices in which the circuit patching bays have been eliminated and where direct cabling as opposed to distributing frame interconnection of equipment units is employed.

3.02 The number of tandem patching bays required in an office is determined by the number of working circuits and the variety of circuit configurations found in that office. The maximum number of circuits that may be provided on a single bay is shown in Table A.

TABLE A

CIRCUIT TYPE	MAX. NO. OF JACK MOUNTINGS	MAX. NO. OF CIRCUITS
Spare consolidated equipment (SCE) circuit	3	60
Spare consolidated equipment with access (SCEWA) circuit	9	30
Patching Trunk	11	See Note
Telephone Circuit	1	1

Note: **The number of patching trunks which may be accommodated on a bay depends on how the trunks are divided between 4W and 6W trunks. A maximum of 330 4W trunks can be accommodated if no 6W trunks are required and a maximum of 270 6W trunks can be accommodated if no 4W trunks are required.**

3.03 The SCE circuits are used to provide spare circuits for the most prevalent circuits in an office. Once established, these spare circuits are restricted to replacing working circuits of exactly the same make-up. Use of the SCEWA circuit differs from the SCE in that it allows the less prevalent circuits to be changed or reconstructed. This is accomplished by connecting any of a number of spare individual equipment units to the normal-through jacks.

3.04 The TPB, in conjunction with a trunk assignment patching bay, provides a simple means for changing, adding, or removing circuits. The SCE, for example, usually requires only three patches to change a circuit. One patch connects to the proper transmission channel at the VF patching jacks for patching to the TPB, another connects the trunk circuit to the SCE jacks, and a third patch connects the 2-way trunk circuit to the appropriate trunk group at the trunk assignment bay.

3.05 When it is not possible to associate a spare trunk circuit with an appropriate trunk group by means such as a trunk assignment patch bay, the spare trunk circuit and its associated spare equipment circuit must be dedicated to use in a particular trunk group. The spare trunk circuit is made busy at the outgoing trunk frame until it is placed in service by removing the busy indication and making appropriate patches at the transmission facility side of the spare equipment circuit.

4. EQUIPMENT CONSIDERATIONS

4.01 The TPB is available in three types of framework: 11-foot 6-inch cable duct (J68896A), 11-foot 6-inch channel (J68896B), and 7-foot cable duct (J68896C). All bays are arranged to mount 23-inch mounting plates or jack mountings. The jacks on the bay are arranged in vertical rows to facilitate identification of the circuits and to simplify the means of designating the jacks. The arrangement of a typical fully equipped 11-foot 6-inch bay and a 7-foot bay is shown in Fig. 1. The layout of jack mountings is the same for all bay frameworks, except when the optional resistor cabinet is added to the 7-foot framework. A minor limitation is then placed on the number of circuits which may be provided because of the scarcity of space for pad mounting.

4.02 The cable duct type framework is the preferred type because of its greater cable

capacity, but the channel type is available for those applications where the TPB is to be located next to a trunk assignment patching bay (channel type). The use of the channel-type bay should be restricted to those cases where the limited cable capacity is adequate for the number of circuits implemented at the bay.

4.03 The TPB should be located in a readily accessible area in the maintenance room. If a trunk assignment patching bay is provided, the TPB should be located next to it, otherwise, the TPB should be located in the testboard area or in the voice-frequency patch bay area.

4.04 Pads for the receiving paths of all spare equipment circuits are mounted at a convenient height on the TPB, which allows them to be changed as required for adjustment of transmission level. Transmitting path pads are always provided at the TPB for SCEWA circuits and may be provided at the TPB as an option for SCE circuits. Any additional pads located elsewhere in the circuit, such as pads built into equipment units, must be equipped with zero-loss pads.

4.05 Spare consolidated equipment with access circuits that have provisions for voice-frequency maintenance connectors (VFMC) use a through-channel connector and pad circuit, J99272CA, to gain access to the drop side of the VFMC. The through-channel connector is mounted in the SF signaling unit socket. The SF signaling units, level adjusting pads, and VFMC associated with SCEWA circuits are mounted on a convenient access bay.

4.06 Spare equipments such as echo suppressors, equalizers, repeaters, etc., used in conjunction with the TPB, are located close to the TPB insofar as it is practical for a given application.

TABLE B

TYPE CIRCUIT	FIG. NO.	TYPE SWITCHING MACHINE	TYPE SIGNALING	PROVISION FOR VF MTCE CONN	ADAPTED FROM FIG. NO.	NOTE
Spare Consolidated Equipment (SCE)	2	4-Wire	SF	No		
	3			Yes		
	4		Built-in	No		
	5			Yes		
	6	2-Wire	SF	No		
	7		Built-in			
Basic Spare Consolidated Equipment With Access (SCEWA)	8	4-Wire	SF	No		
	9			Yes		
	10	2-Wire		No		
Adaptations of Basic Spare Consolidated Equipment With Access (SCEWA)	11	4-Wire	Built-in	No	8	*
	12					*,†
	13		SF			†
	14					†,‡
	15		Built-in	Yes	9	*
	16					*,†
	17		SF			†
	18					†,‡
	19	2-Wire	Built-in	No	10	*
	20					*,†
	21		SF			†
	22					†,‡

*Adapted for use with transmission systems with built-in signaling.

†Adapted for insertion of individual equipment units (E SPR, 4W TRMSN Unit).

‡Adapted for substitution of an SF signaling unit of a different type.

The following notes are referenced in Fig. 2 through 22.

Note 1: 4W TRMSN may be any 4-wire transmission equipment such as loss equalizers, delay equalizers, or amplifiers.

Note 2: When pads located at the tandem patching bay are in tandem with remotely located pads (including those pads which are part of 4-wire terminating circuits), the remote pads should be set to zero loss.

Note 3: SF signaling units used in conjunction with SCEWA circuits should be located in close proximity to the tandem patching bay.

Note 4: A through-channel connector and pad circuit, J99272CA (SD-97401-01), equipped with zero-loss pads, may be used to gain access to the drop side of VF maintenance connectors which are mounted together with SF signaling units and pads on access bays. This connector mounts in the SF signaling unit socket.

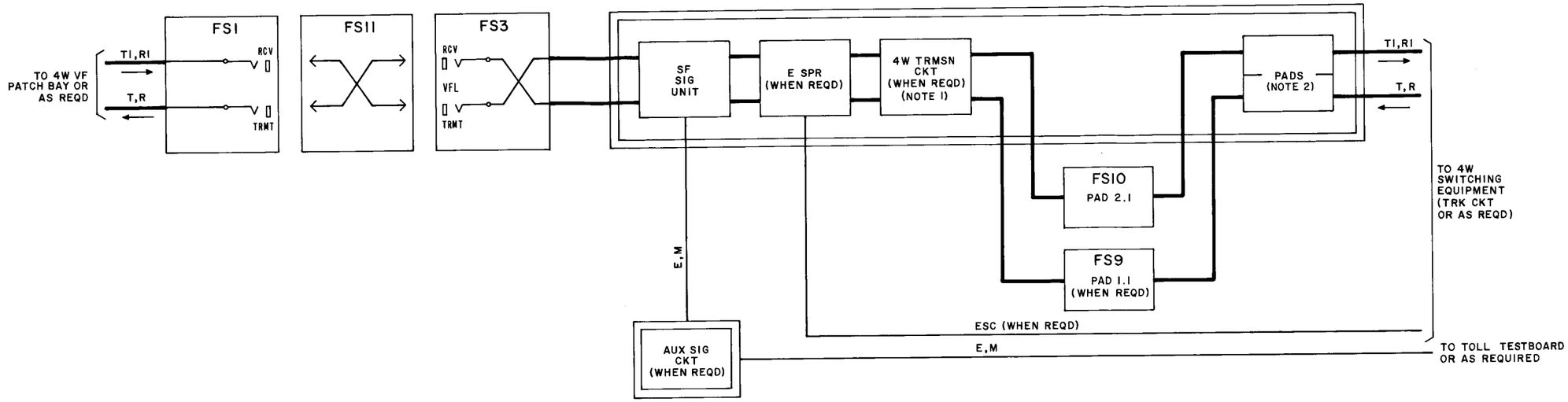

Fig. 2—Typical Spare Consolidated Equipment (SCE) Patch Circuit 4 Wire Switching

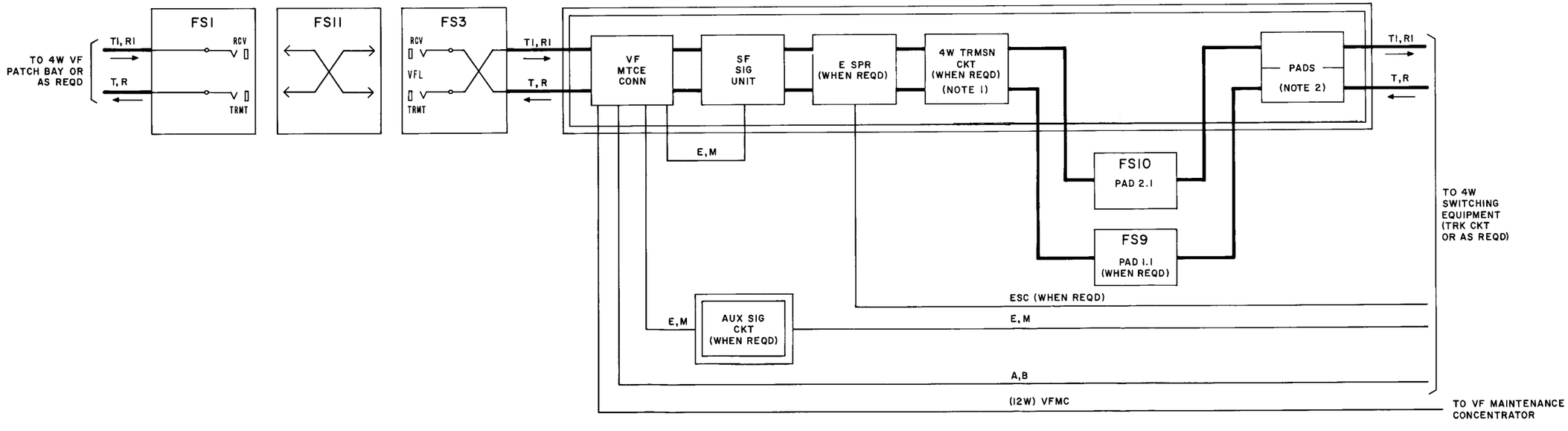

Fig. 3—Typical Spare Consolidated Equipment (SCE) Patch Circuit With Provision for VF Maintenance Connector 4 Wire Switching

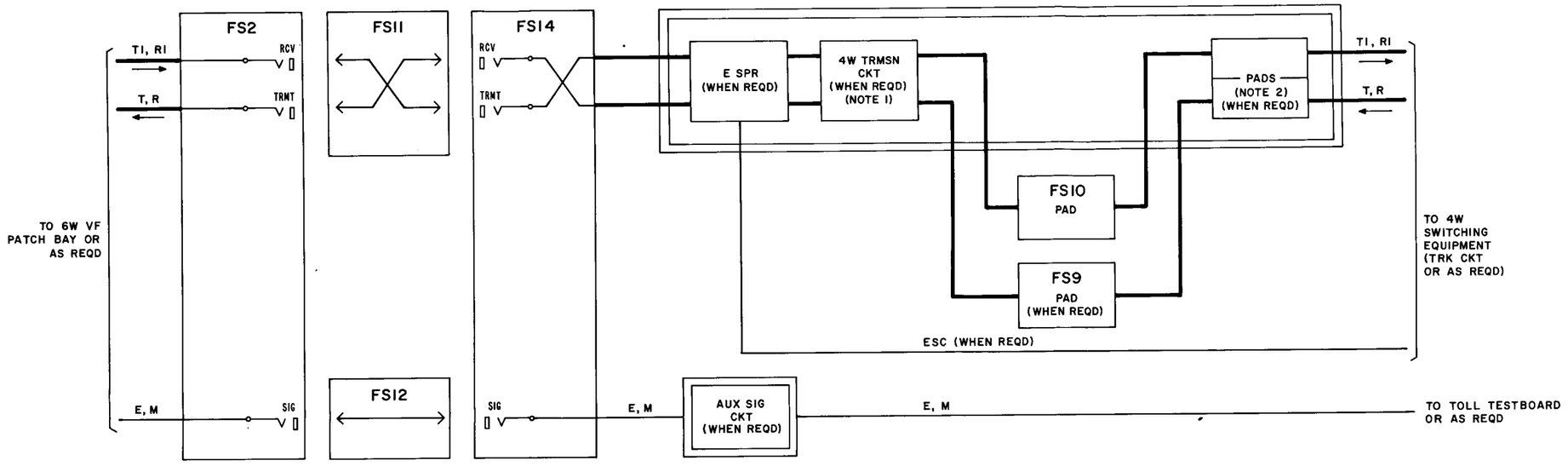

Fig. 4—Typical Spare Consolidated Equipment (SCE) Patch Circuit for Use With Transmission Systems With Built-In Signaling 4W Switching

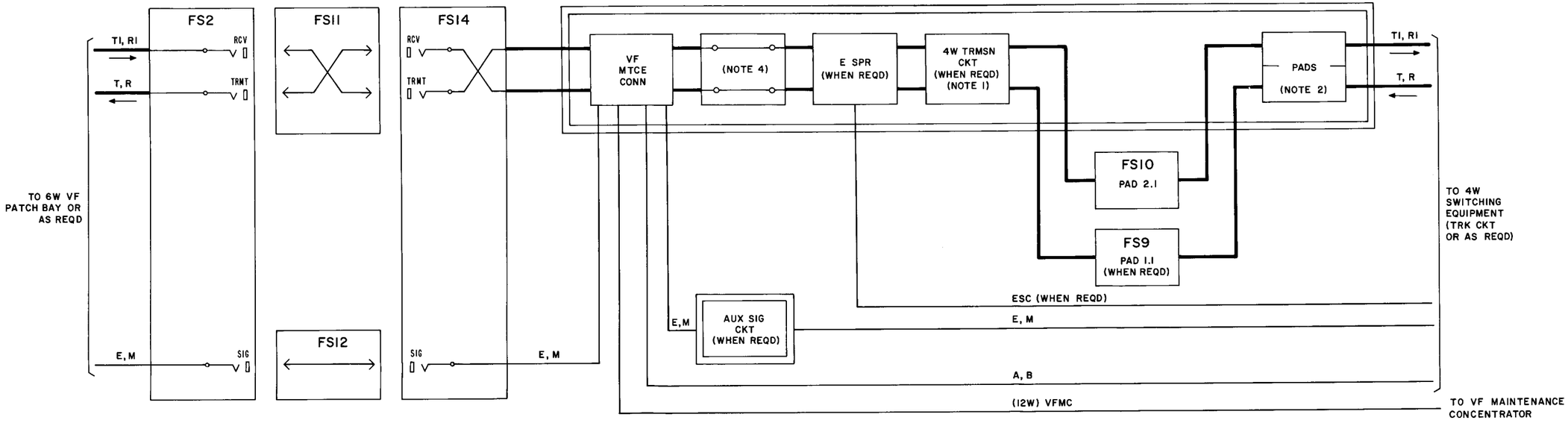

Fig. 5—Typical Spare Consolidated Equipment (SCE) Circuit With Provision for VF Maintenance Connector for Use With Transmission Systems With Built-In Signaling 4W Switching

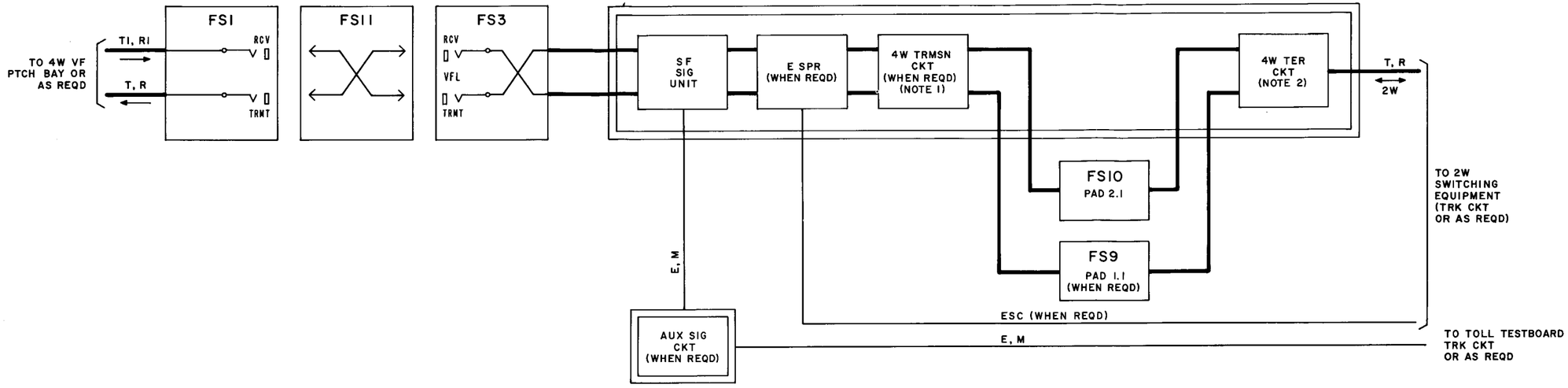

Fig. 6—Typical Spare Consolidated Equipment (SCE) Patch Circuit 2 Wire Switching

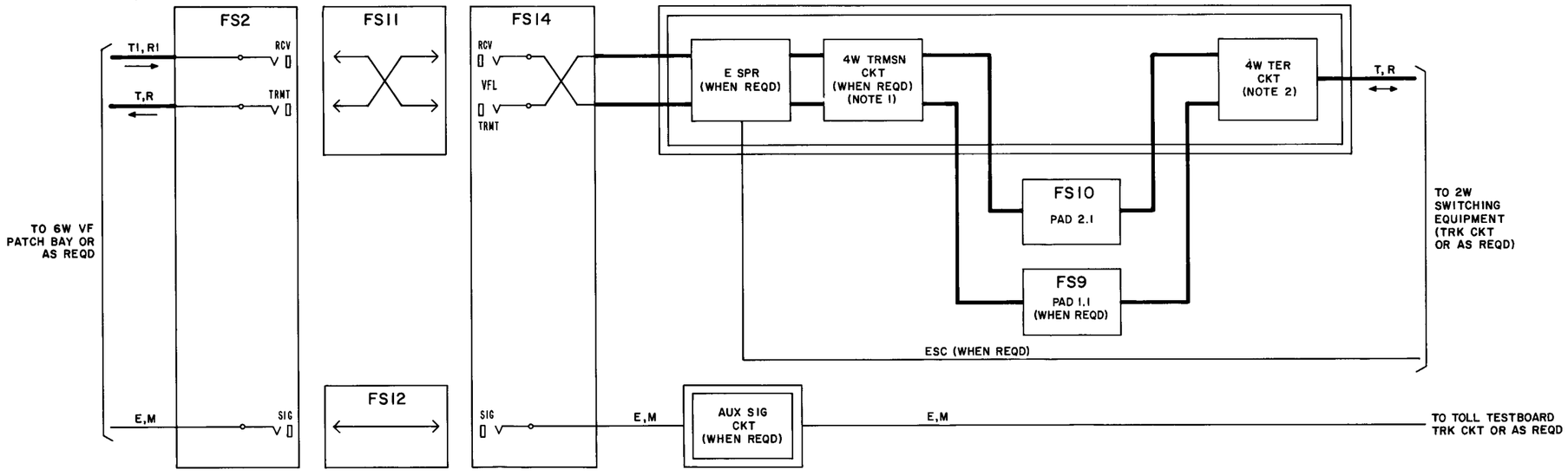

Fig. 7—Typical Spare Consolidated Equipment (SCE) Circuit for Use With Transmission Systems With Built-In Signaling 2W Switching

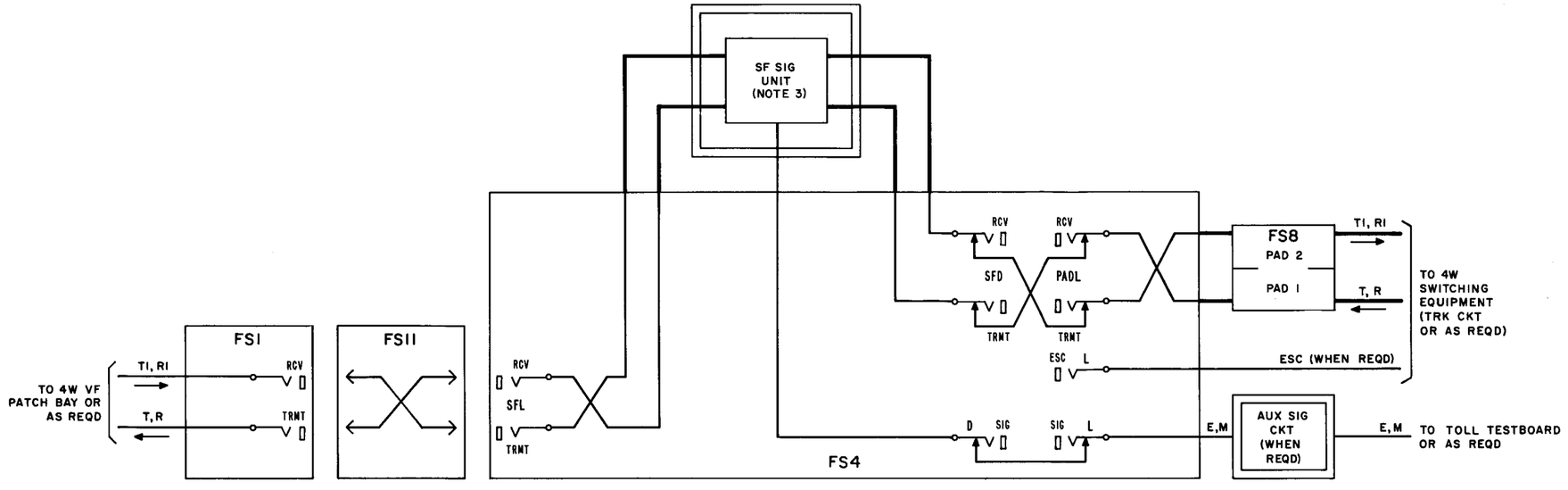

Fig. 8—Typical Spare Consolidated Equipment With Access (SCEWA) Patch Circuit 4 Wire Switching

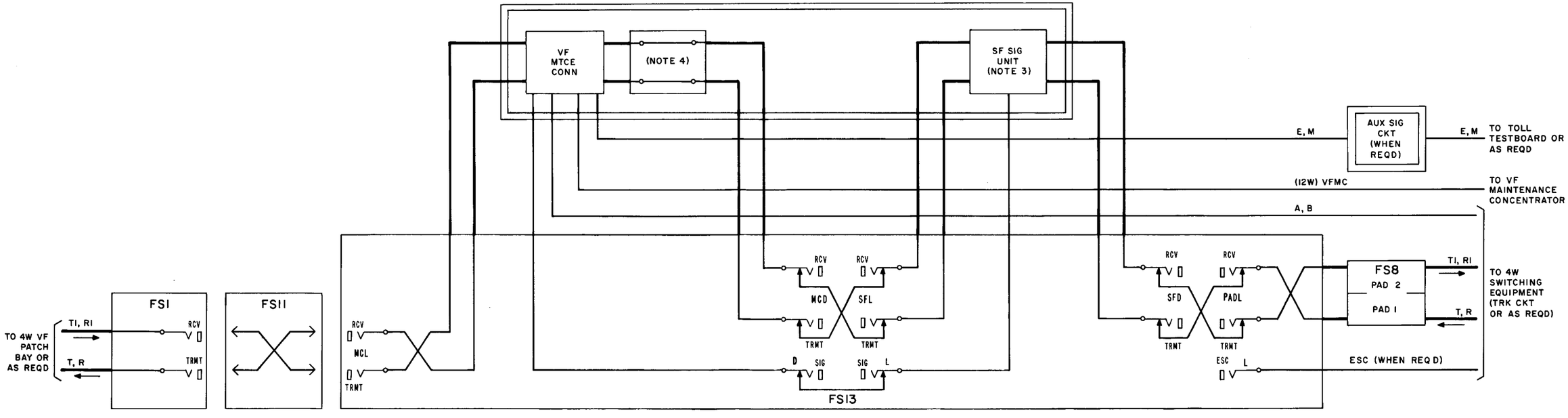

Fig. 9—Typical Spare Consolidated Equipment With Access (SCEWA) Circuit With Provision for VF Maintenance Connector 4W Switching

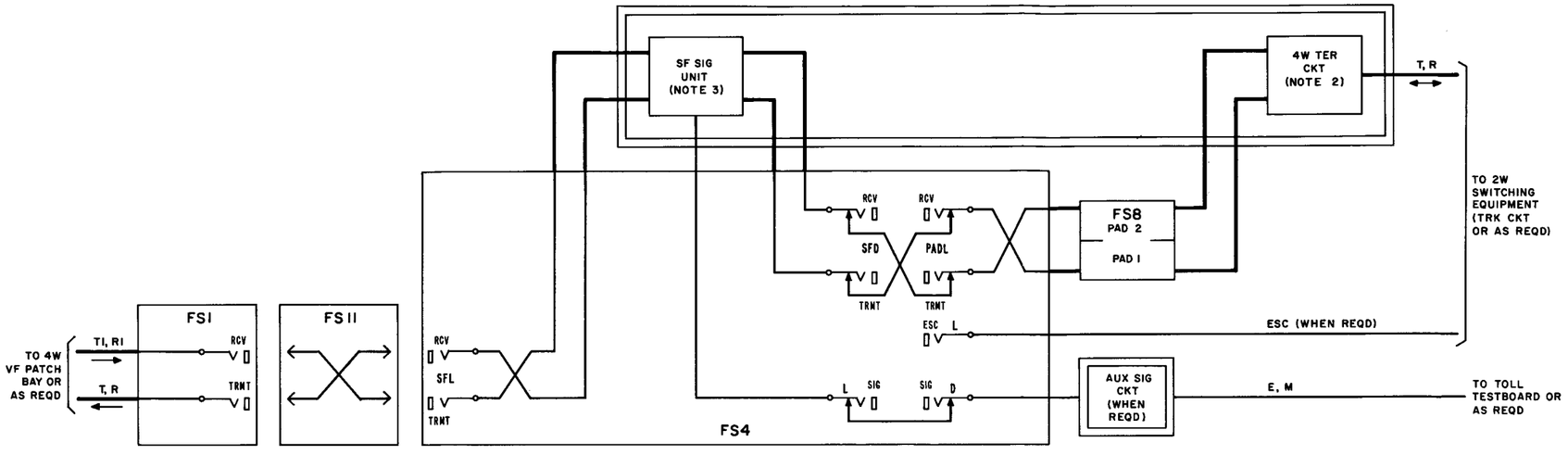

Fig. 10—Typical Spare Consolidated Equipment With Access (SCEWA) Patch Circuit 2 Wire Switching

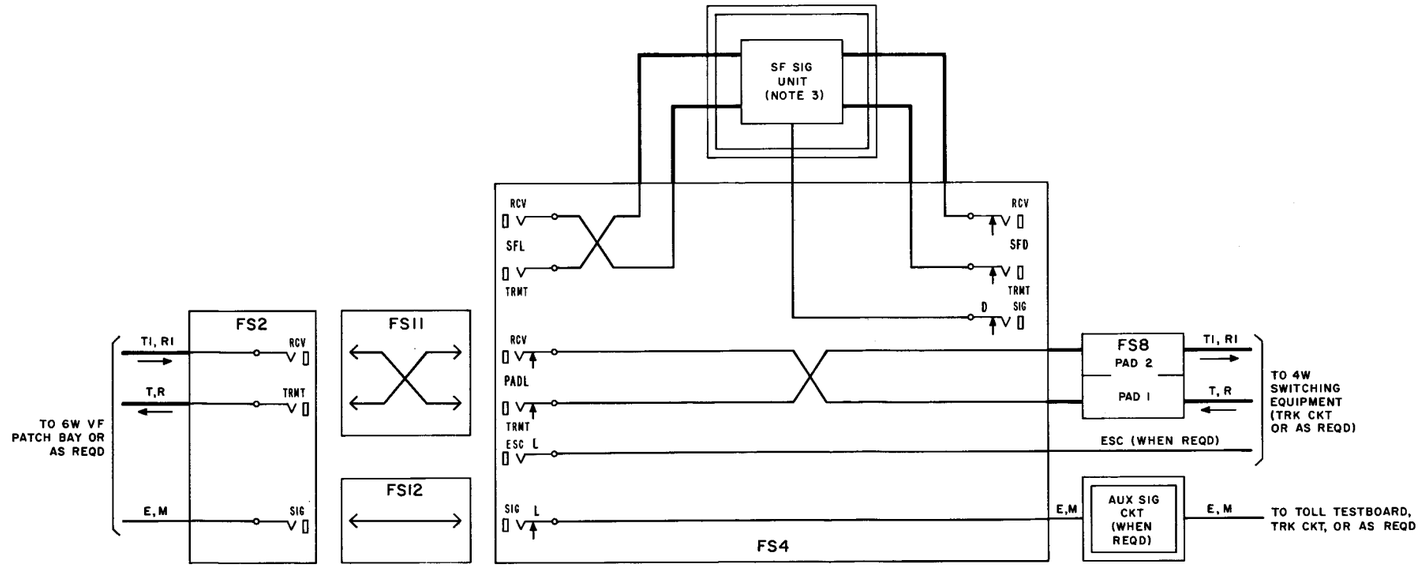

Fig. 11—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Patch Circuit for Transmission Systems With Built-In Signaling 4W Switching

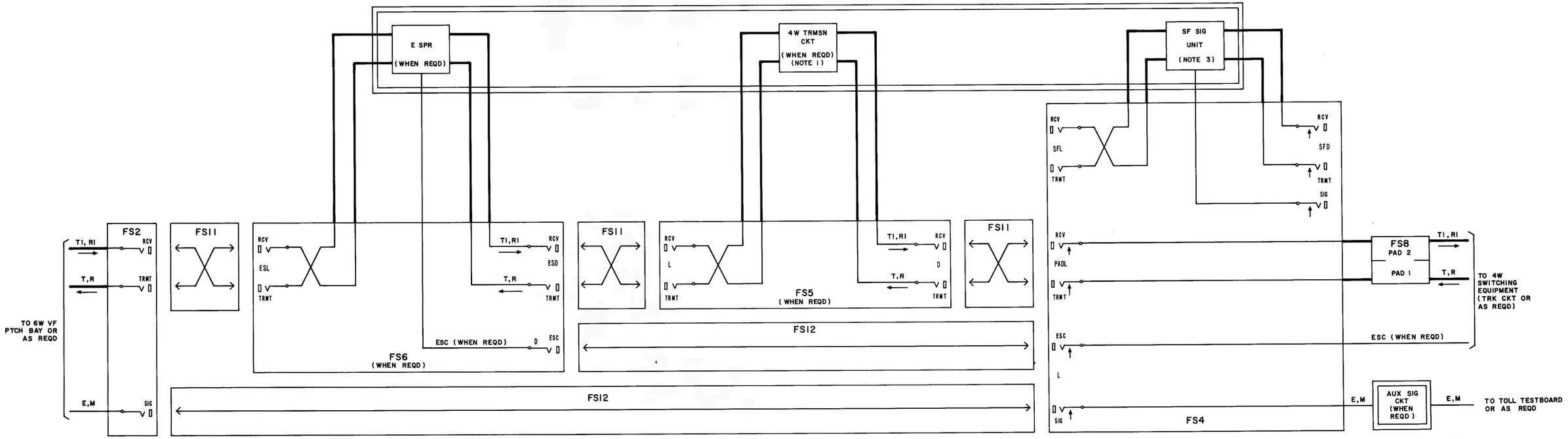

Fig. 12—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit for Use With Transmission Systems With Built-In Signaling Where Fig. 8 is Adapted to Include an Echo Suppressor and/or 4W Transmission Circuit 4W Switching

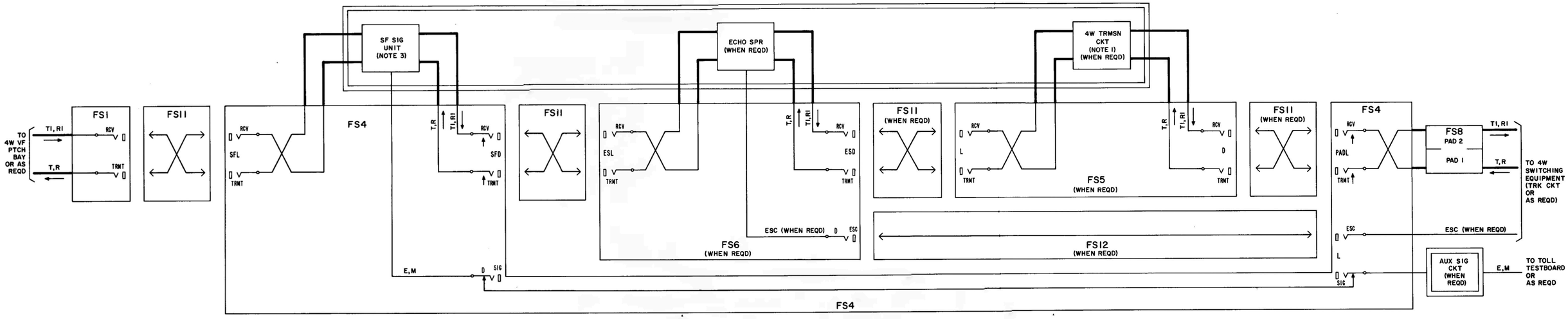

Fig. 13—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit Where Fig. 8 is Adapted to Include an Echo Suppressor and/or 4W Transmission Circuit 4W Switching

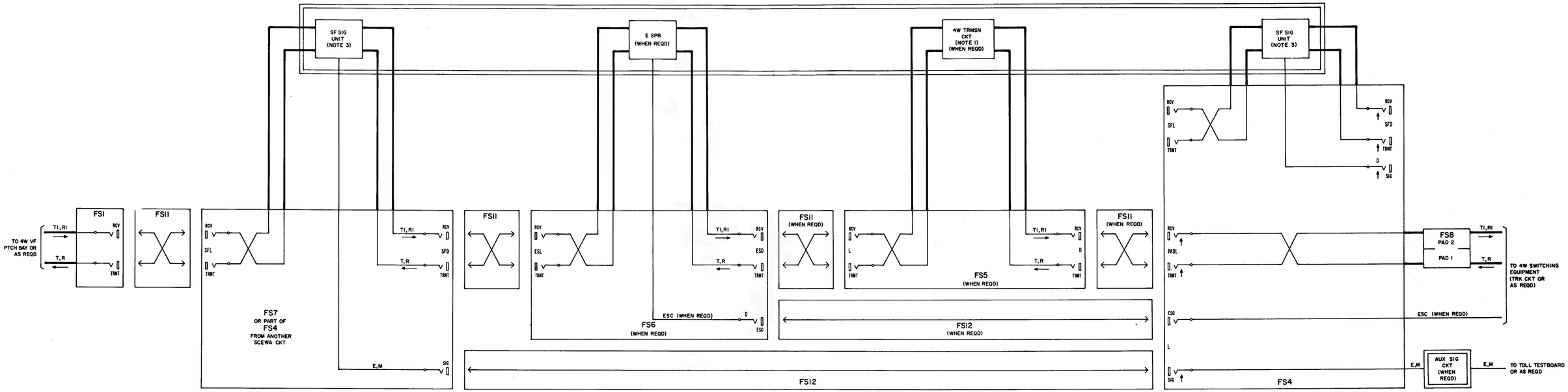

Fig. 14—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit Where Fig. 8 is Adapted to Include an Echo Suppressor and/or a 4W Transmission Circuit and/or to Replace the SF Signaling Unit 4W Switching

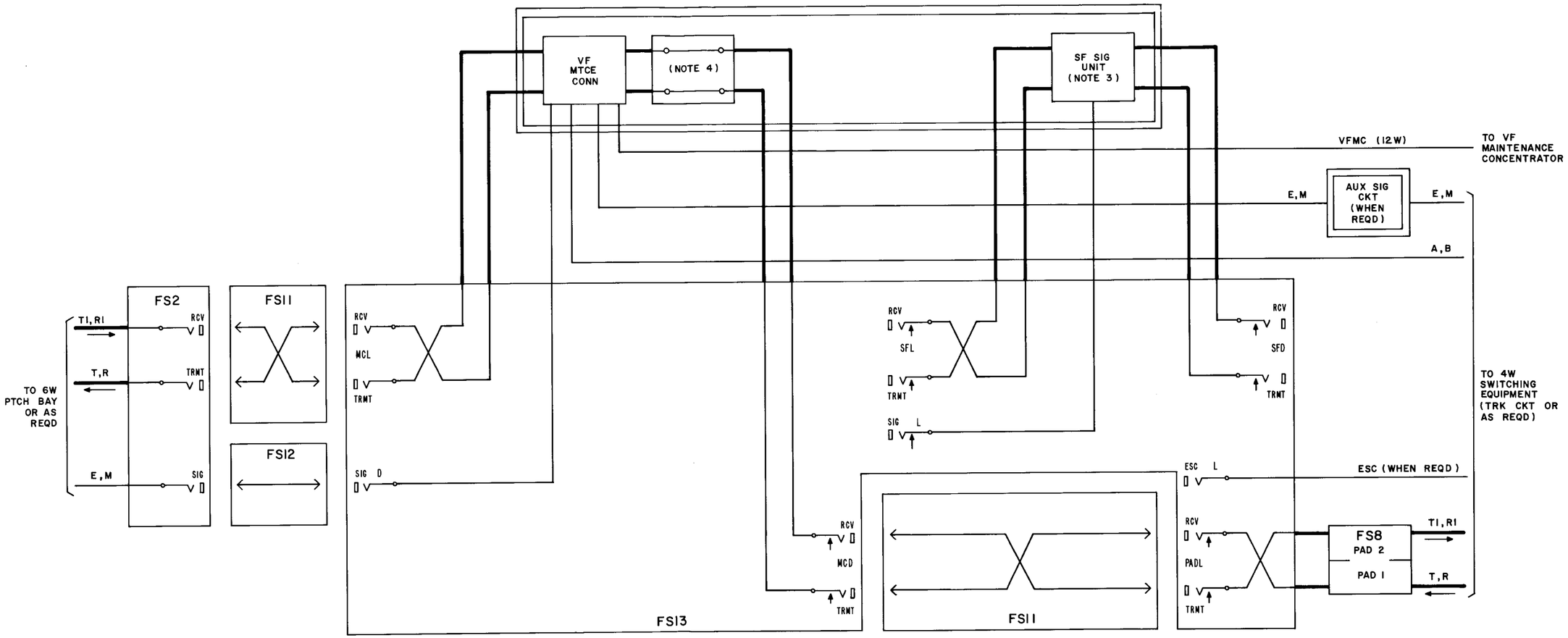

Fig. 15—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit With Provision for VF Maintenance Connector for Use With Transmission Systems With Built-In Signaling 4W Switching

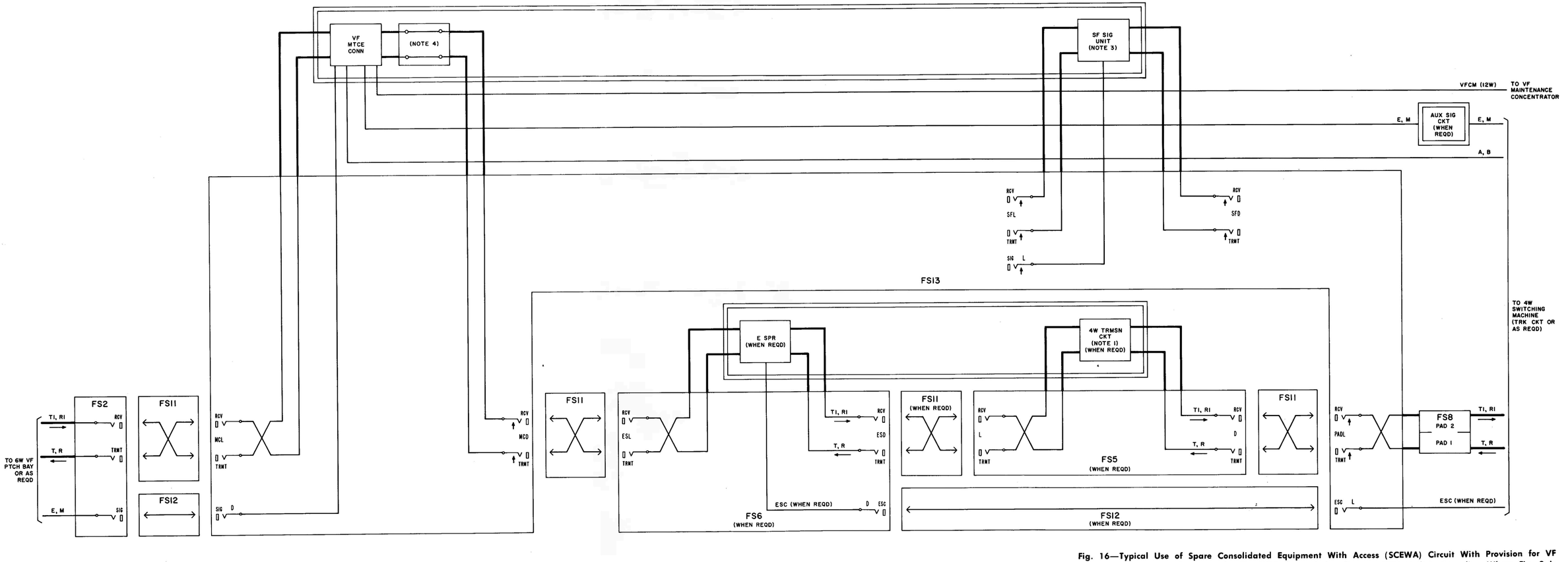

Fig. 16—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit With Provision for VF Maintenance Connector for Use With Transmission Systems With Built-In Signaling Where Fig. 9 is Adapted to Include an Echo Suppressor and/or 4W Transmission Circuit 4W Switching

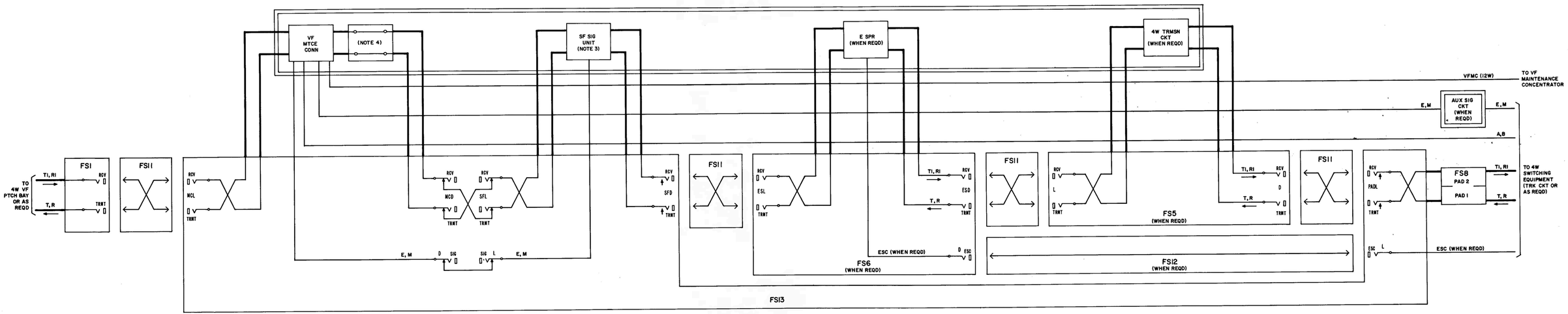

Fig. 17—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit With Provision for VF Maintenance Connector Where Fig. 9 is Adapted to Include an Echo Suppressor and/or 4W Transmission Circuit 4W Switching

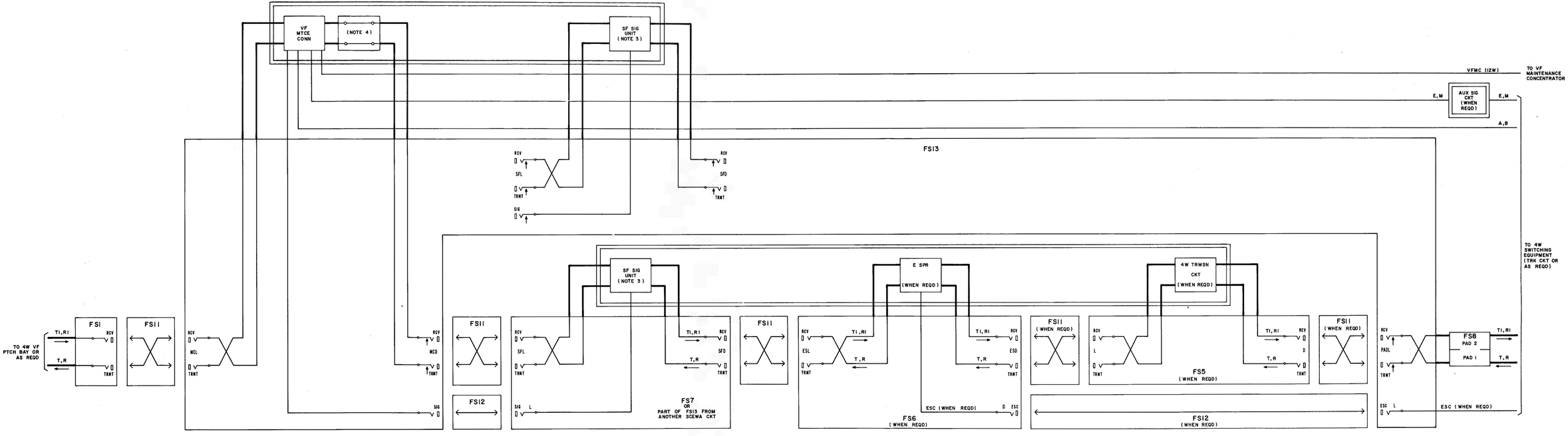

Fig. 18—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit With Provision for VF Maintenance Connector Where Fig. 9 is Adapted to Include an Echo Suppressor and/or a 4W Transmission Circuit and/or to Replace the SF Signaling Unit 4W Switching

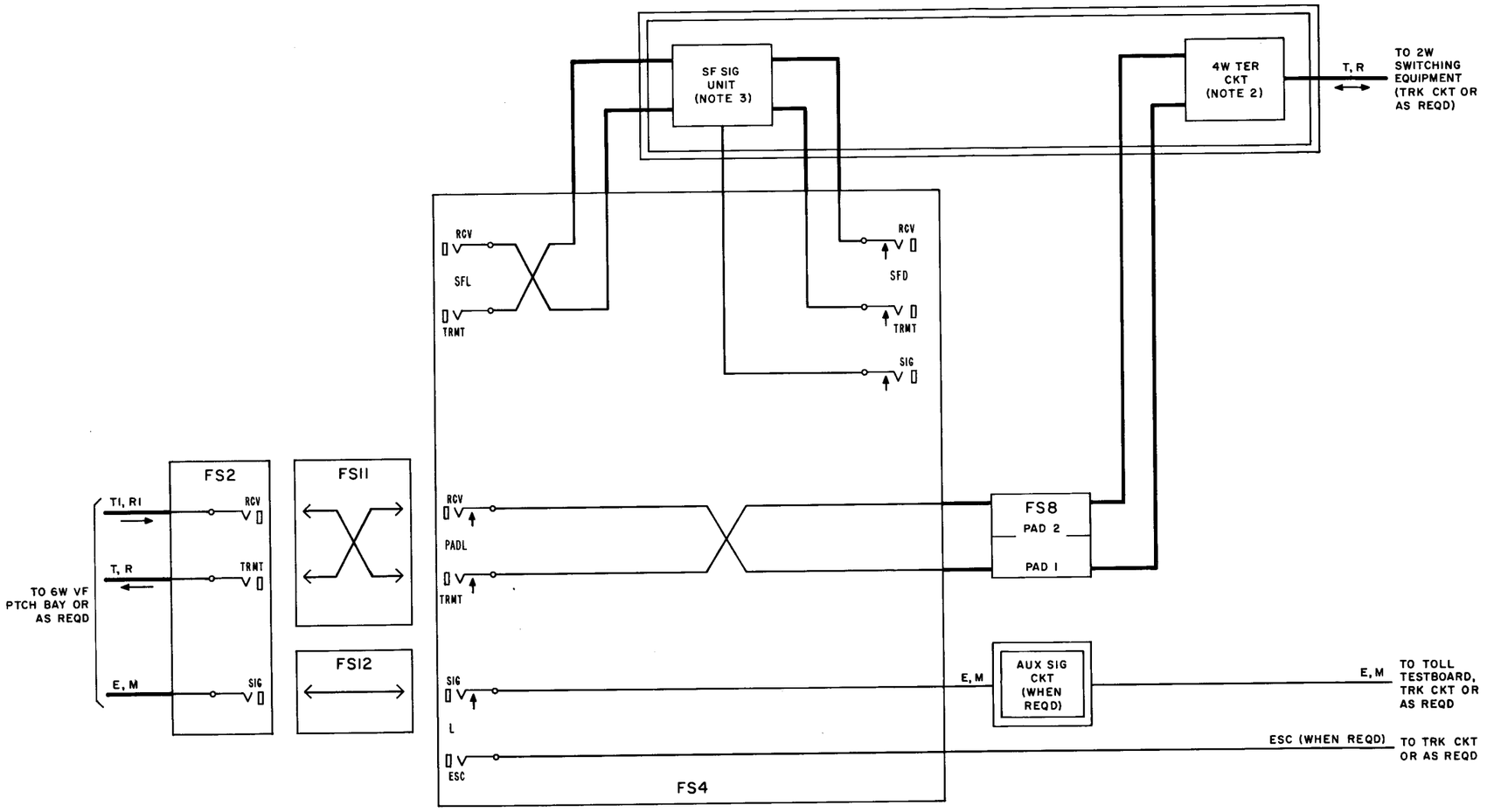

Fig. 19—Typical Spare Consolidated Equipment With Access (SCEWA) Circuit for Use With Transmission Systems With Built-In Signaling 2W Switching

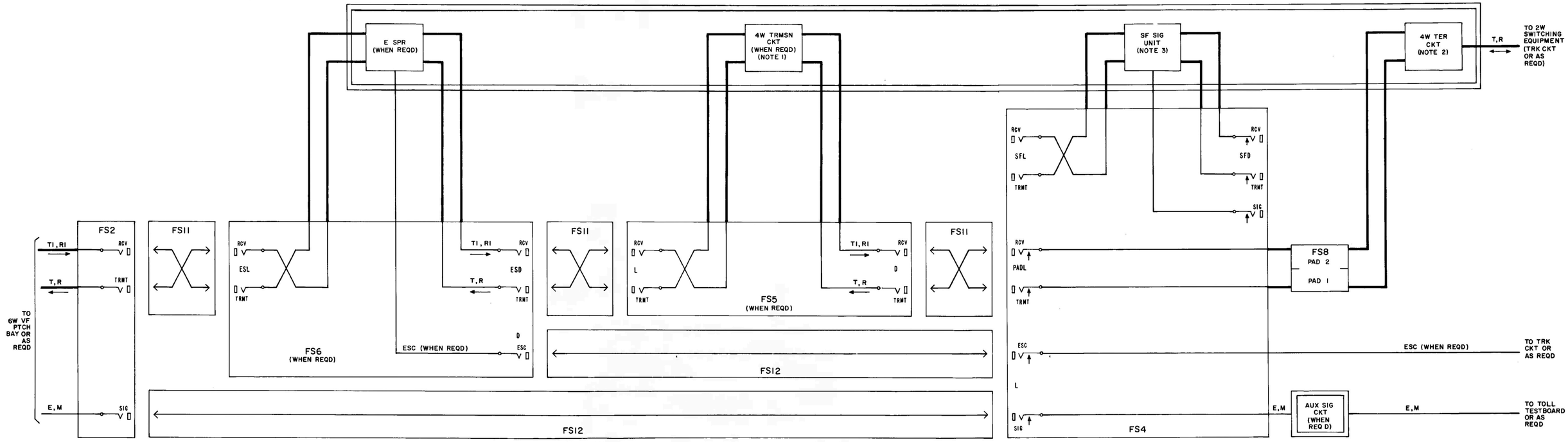

Fig. 20—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit for Use With Transmission Systems With Built-In Signaling Where Fig. 10 is Adapted to Include an Echo Suppressor and/or 4W Transmission Circuit 2W Switching

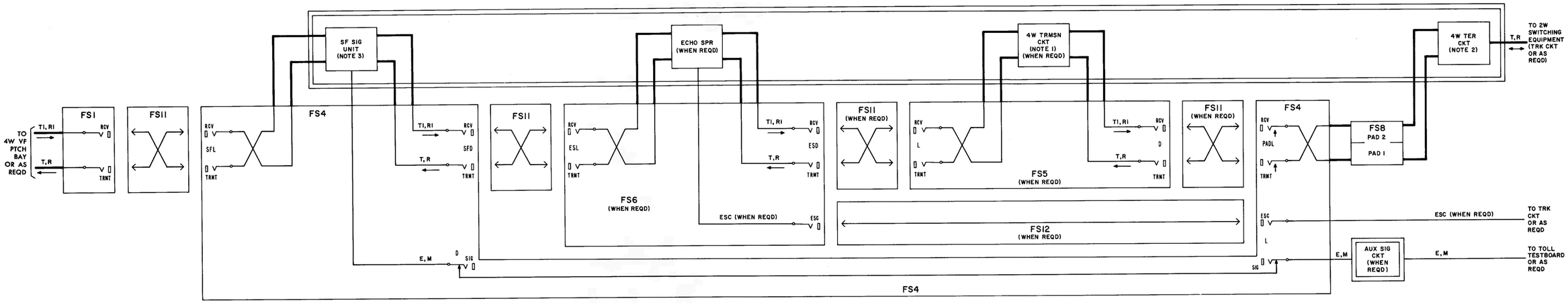

Fig. 21—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit Where Fig. 10 is Adapted to Include an Echo Suppressor and/or a 4W Transmission Circuit 2W Switching

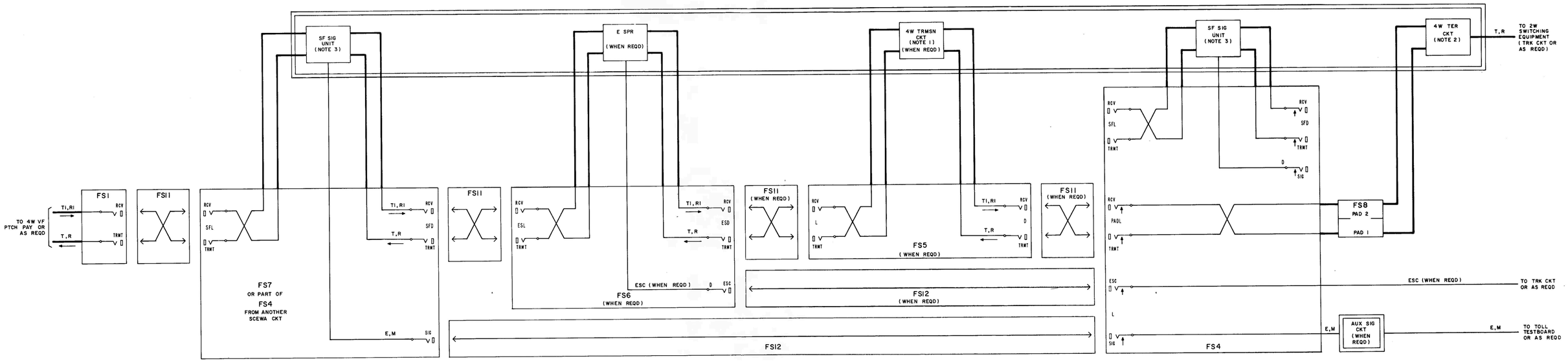

Fig. 22—Typical Use of Spare Consolidated Equipment With Access (SCEWA) Circuit Where Fig. 10 is Adapted to Include an Echo Suppressor and/or a 4W Transmission Circuit and/or to Replace the SF Signaling Unit 2W Switching